August 6, 1945

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

TECHNOLOGY DEPT.

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The PRECISION AGE in COLD ROLLED STRIP STEEL

The first Steckel mill, which revolutionized the flat-rolling of metal, was constructed in 1923. The superior product resulting from the new principles involved was first recognized and demonstrated by The Cold Metal Process Company. Since that time throughout the industry a complete changeover to Steckel-type mills has been made. Today's exacting standards of accuracy and uniformity in tremendous tonnages of flat-rolled material are met consistently by these mills. Cold Metal, FIRST, with Precision rolling equipment, holds its leadership with THINSTEEL, the light gauge strip steel product made on Steckel mills by The Cold Metal Products Co.

CMP STRIP STEEL
PRECISION COLD ROLLED

GIVES MAXIMUM PRODUCTION PER TON

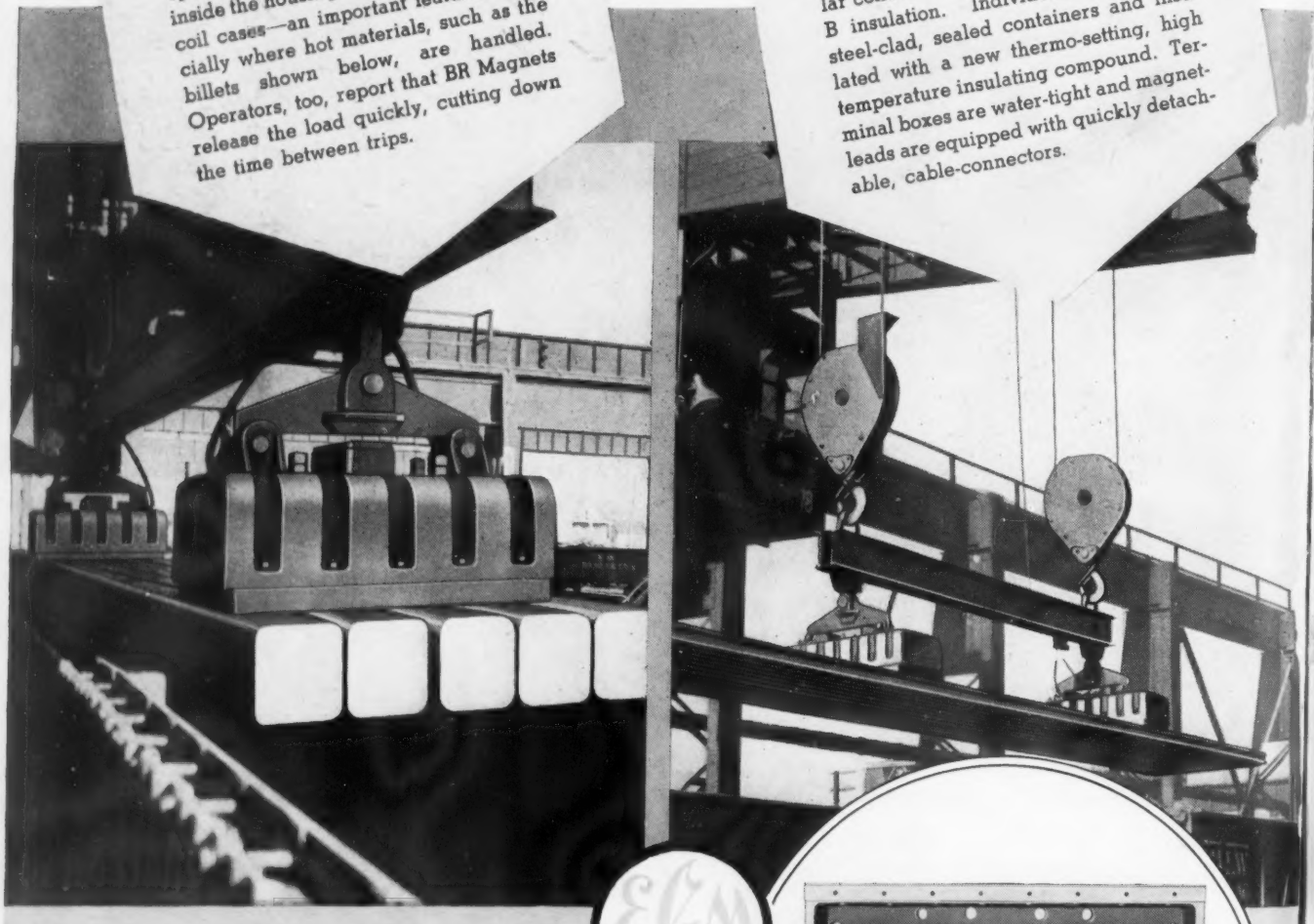
THE COLD METAL PRODUCTS CO.
Subsidiary of The Cold Metal Process Co.
YOUNGSTOWN 1, OHIO

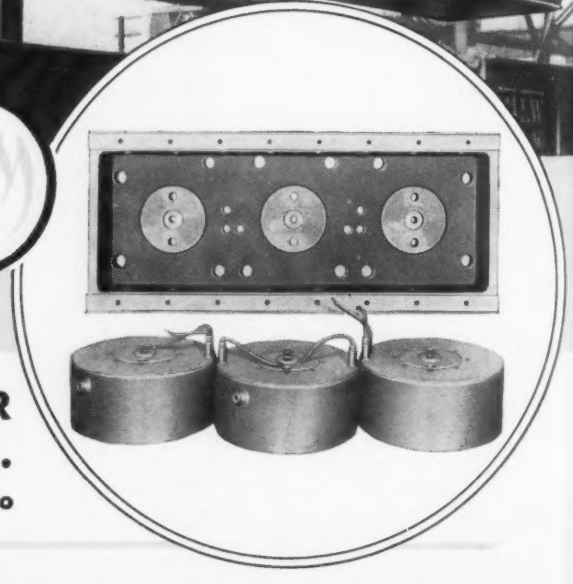
Improved BILLET and RAIL HANDLING with EC&M "BR" MAGNETS

These are heavy-duty magnets designed especially for handling rails, billets, bars, pipe, structural shapes, etc. Usually they are worked in pairs, being suspended by their suspension yoke from a spreader-bar and operated in parallel from one controller. For single magnet installation, chain suspension is standard.

Magnet-housings have ventilating openings in the top and both sides. These openings permit free circulation of air inside the housing around the individual coil cases—an important feature, especially where hot materials, such as the billets shown below, are handled. Operators, too, report that BR Magnets release the load quickly, cutting down the time between trips.

The design of these Type BR Magnets departs radically from the conventional in that, instead of a single (or perhaps two) oblong coils, these BR Magnets are fitted with several tightly wound, circular coils of bare strap copper with Class B insulation. Individual coils are in steel-clad, sealed containers and insulated with a new thermo-setting, high temperature insulating compound. Terminal boxes are water-tight and magnet-leads are equipped with quickly detachable, cable-connectors.





Above: Pair of No. 2 Type BR Magnets with five billets for deposit into annealing box.

Upper Right: Pair of No. 3 Type BR Magnets lifting single layer of rails—also used for handling double locked layer of rails.

Lower Right: Pre-assembly view showing how circular coils are keyed and bolted to No. 3 BR Magnet Housing.

THE ELECTRIC CONTROLLER AND MANUFACTURING CO.

2698 East 79th Street **Cleveland 4, Ohio**

Call on BETHLEHEM FOR ROLLED AND FORGED CIRCULAR PRODUCTS

When you need products of this nature, let Bethlehem study your requirements and make suitable recommendations. Bethlehem has extensive facilities for making rolled and forged circular products in a wide range of sizes (approximately 10 in. to 45 in. o.d.) . . . and the years have demonstrated their advantages in a long list of industrial applications.

Here are a few of the reasons:

- ★ Bethlehem's forged-steel circular products are furnished rough-machined. This means less finishing work for the customer.
- ★ They have uniform metal density; are strong, tough, shock-resisting.
- ★ Because of their homogeneity and greater strength, they frequently make possible thinner sections; hence effect savings in weight.

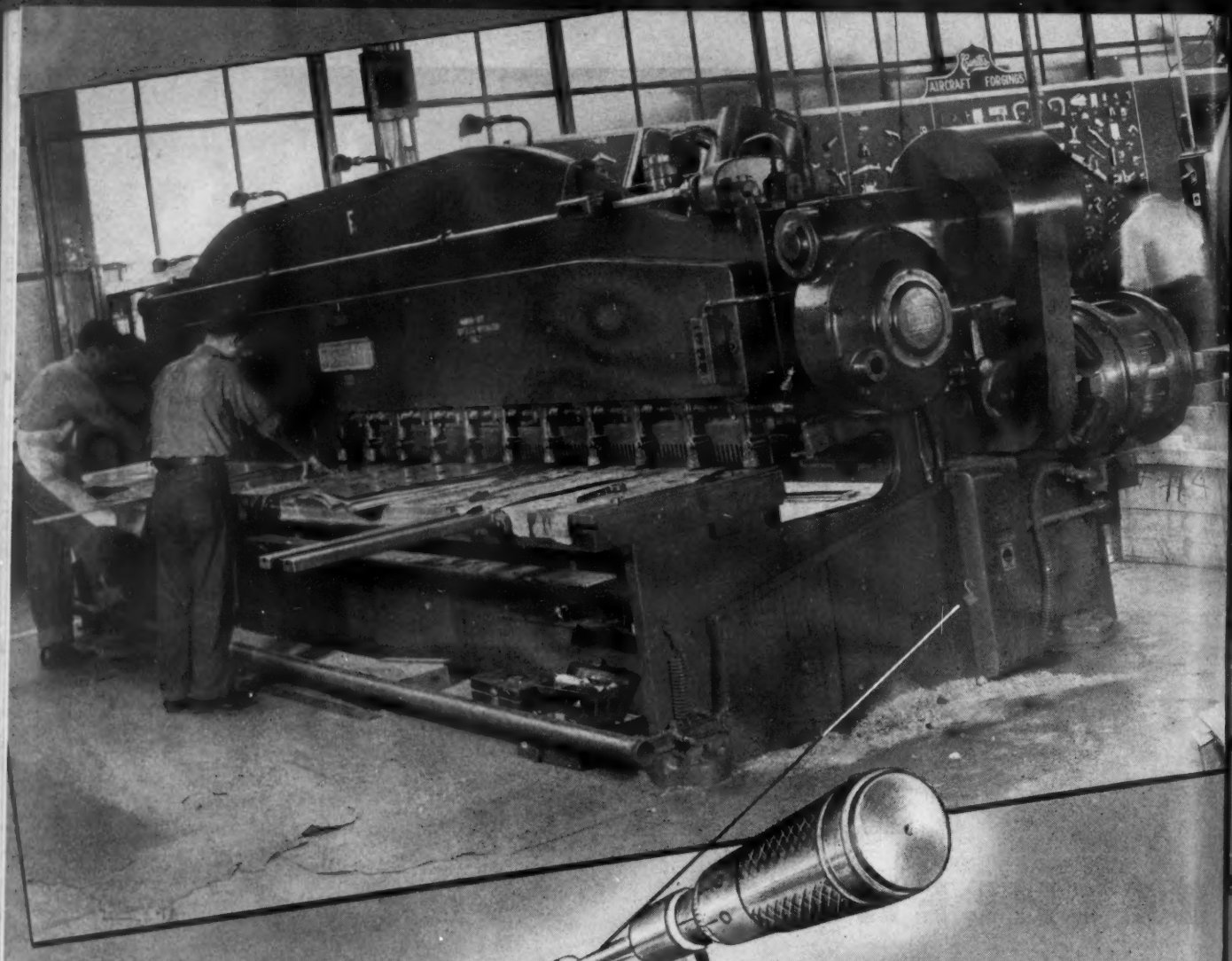
Always call on Bethlehem when in the market for circular steel products. We're old hands at the business. Send us your inquiries.

Bethlehem makes:

CRANE-TRACK WHEELS
BEVEL ROLLERS
TURBINE WHEELS
SHEAVE WHEELS
Blanks for
SPUR, BEVEL, MITRE,
and Other Types of Gears

This is only a partial list. For additional information, write to Bethlehem Steel Co., Bethlehem, Pa.

BETHLEHEM STEEL



Shear to THOUSANDTHS OF AN INCH...

The square blank—the accurate blank—is the profitable blank. The rapid, accurate performance of Cincinnati Shears saves many an hour in the forming and punching operations, and many an hour in the general assembly and fabrication that follow.

Cincinnati Shears pay double dividends in time saved in shearing and in time saved in fabrication.

• *Write for Shear Catalog No. S-3.*

THE CINCINNATI SHAPER CO.

CINCINNATI OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

McKAY

Resistance Weld TUBE MILLS

PRECISION BUILT FOR CONTINUOUS PRODUCTION

Electric Resistance Weld
e Mills can be put to work
ly and easily in your plant.
present dependable personnel,
instruction, will become en-
ly competent to operate a
Kay mill.

has been accomplished by:

Simplifying and centralizing all necessary controls.

Complete protection through approved safety devices and interlocks.

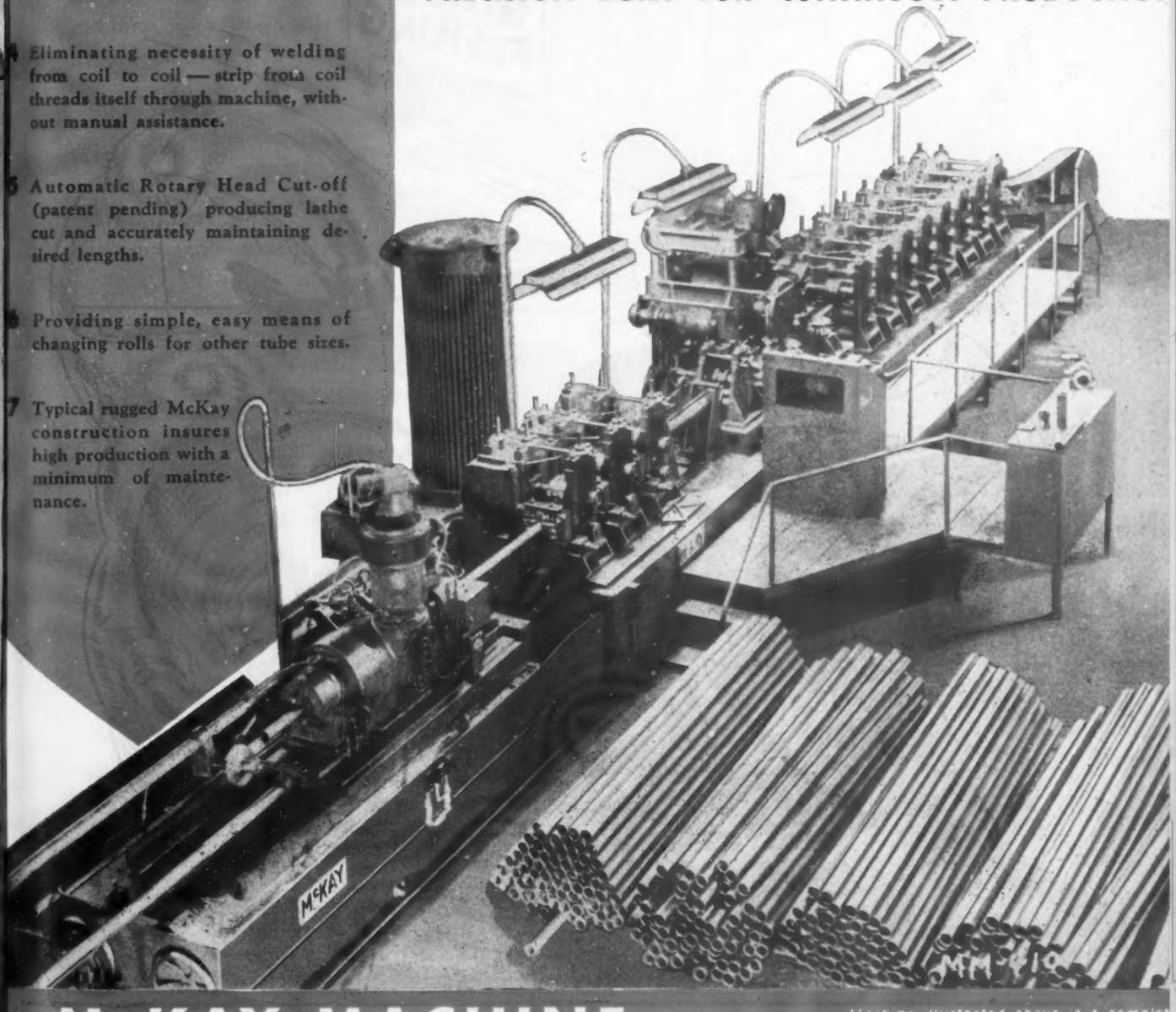
Supplying motor drives and push button controls to essential heavy duty motions.

Eliminating necessity of welding from coil to coil — strip from coil threads itself through machine, without manual assistance.

Automatic Rotary Head Cut-off (patent pending) producing lathe cut and accurately maintaining desired lengths.

Providing simple, easy means of changing rolls for other tube sizes.

Typical rugged McKay construction insures high production with a minimum of maintenance.



he McKAY MACHINE Company

INEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

Machine illustrated above is a complet
Tube Mill, capable of producing 2" O.D
to 4½" O.D. tubes from 16 ga. to 8 ga
flat strip. McKay builds Tube Mills i
sizes ranging from ⅜" O.D. We solici
your inquiries.

BEHIND THE SCENES

SHRDLU
GONE FISHING
SCENE I
LET'S SPRING ONE OF HIS OWN CORNY CRACKS ON HIM...LET'S TELL HIM WE AIN'T BITING BECAUSE WE AIN'T GOT NO TEETH!
SCENE II

Vol. 117, No. 6, August 6, 1945, issue of STEEL, published every Monday at Cleveland, Ohio. Entered as second class matter at the post office, Cleveland, O., under act of March 3, 1879. U. S. possessions, Canada, Mexico, Cuba, Central and South America, 1 year $6; 2 years $10; all other countries, 1 year $12. Current issues, 25c. Yearbook of Industry issue, $2.00.

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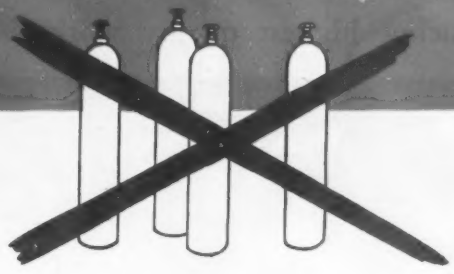
IS HIGH-COST OXYGEN CHOKING YOUR INDUSTRIAL ACTIVITY ?

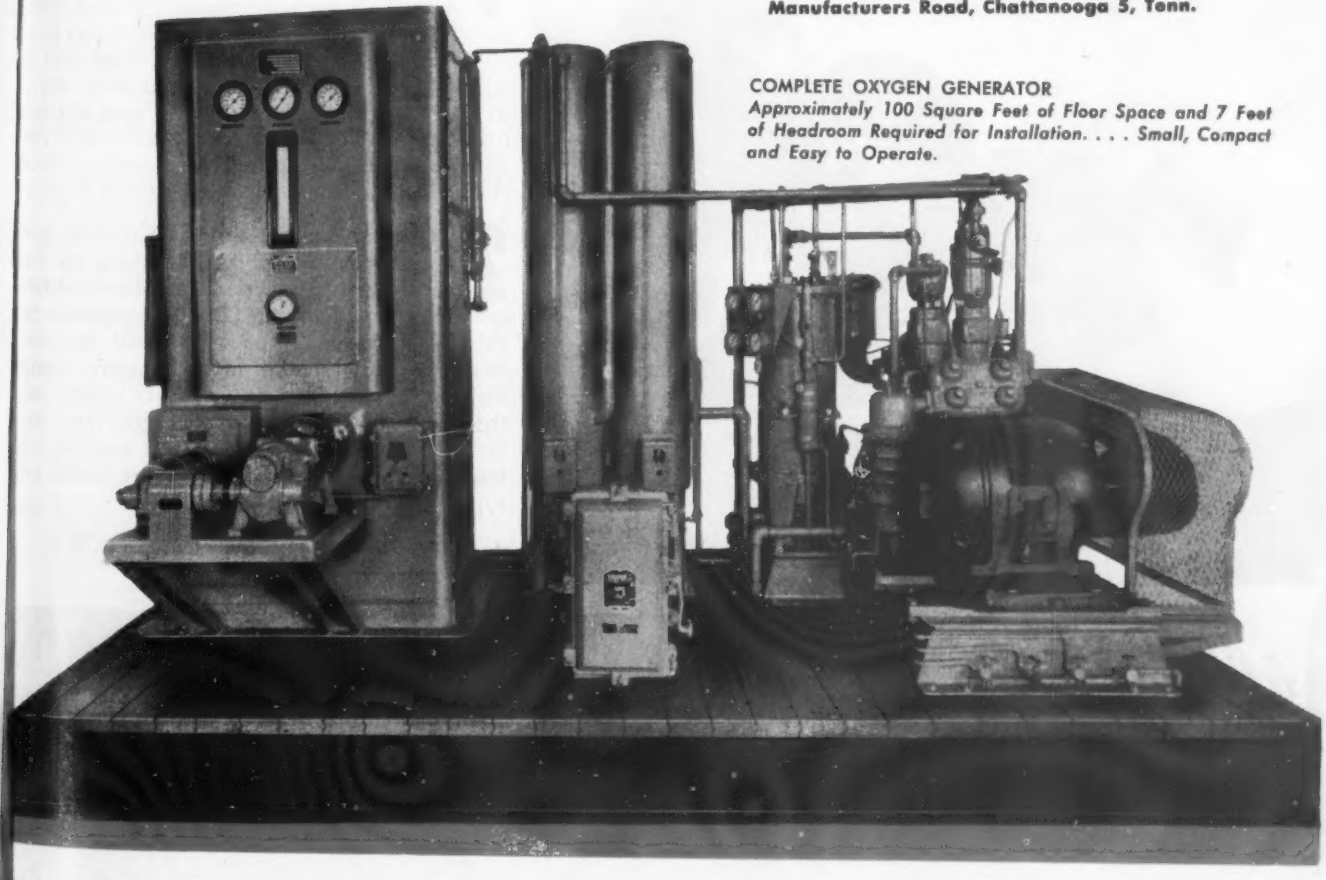


Oxygen is the most abundant of all elements, and there is no reason why you should restrict the use of oxygen in your plant because of high cost. You can solve your oxygen problems at the source by making your own oxygen with your own personnel in your own plant.

Modern and efficient AIR PRODUCTS oxygen generators will cut your manufacturing costs and increase your profits. Let our engineers show you how you can save up to 60% on your oxygen costs. Write today.

Air Products
INCORPORATED

Manufacturers Road, Chattanooga 5, Tenn.



COMPLETE OXYGEN GENERATOR
Approximately 100 Square Feet of Floor Space and 7 Feet of Headroom Required for Installation. . . . Small, Compact and Easy to Operate.

Allis-Chalmers Electrodes Have Got To Be Good!

— BECAUSE: 1) We use them by the ton *ourselves* — day in and day out . . . 2) We constantly check weld metal by X-Ray, tensile machine, metallographic microscope, etc. — to make *sure* that A-C electrodes are *continually* producing highest quality work.

1 Allis-Chalmers supplies to industry the world's greatest variety of capital goods—over 1600 types of products. Skilled workmanship by thousands of welding operators plays an important part in that record. And *tons* of Allis-Chalmers electrodes are used every day—in such A-C shops as above—to turn out this massive production. Since A-C's *own* weld production hinges on the uniform quality of these electrodes you can see that *they've got to be good!*

2 One of the typical tests Allis-Chalmers sample welds undergo is inspection on this metallographic microscope. Minute details can be enlarged up to 12,000 diameters—enabling *accurate* study of weld metal structure. With the constant aid of modern research equipment such as this, Allis-Chalmers makes *sure* that A-C electrodes are *made* right—and *perform* right. Try them on *your* next welding job. Our nearby district office or welder dealer can supply you.

A 1810

ALLIS-CHALMERS, MILWAUKEE 1, WIS.

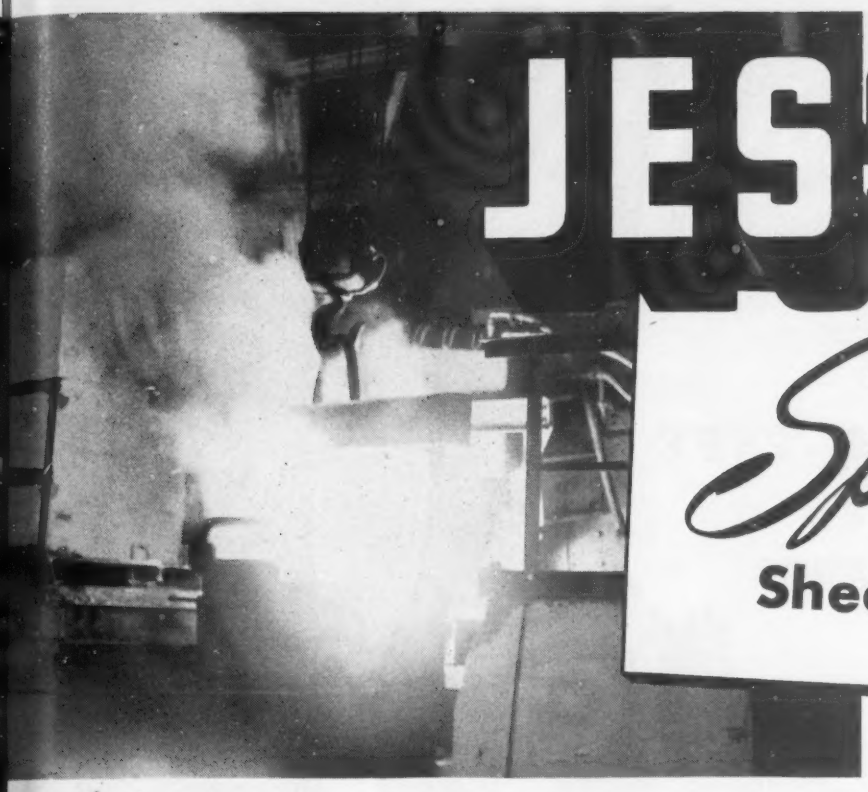
A-C Electrodes
EASY TO REMEMBER
EASY TO BUY
Sold by AWS Number

HEADQUARTERS FOR WELDING EQUIPMENT

AMPAC A-C WELDERS

WELD-O-TRON D-C WELDERS

ARC WELDING ACCESSORIES



JESSOP

Specialty

Sheet and Plate

- High Speed Sheet
- Stainless-Clad Steel
- Solid Stainless Steel
- Circular Saw Steels
- Rectangular Saw Steels
- Hacksaw Sheets (High Speed, Tungsten, Alloy, Carbon)
- Light Armor Plate (Homogeneous)
- Light Armor Plate (Face Hardened)
- Light Armor Plate (Non-Magnetic)
- Aircraft Sheets
- Magnet Steels
- Knife Blade Steels
- Back Spring Steels
- Cutlery Steels
- Non-Magnetic Steels
- Quality Spring Steels
- Composite Hacksaw Sheets
- E9 Super High Tensile Sheets
- And Many Others

for your most exacting applications

Jessop Steel Sheet and Plate Specialties are produced in electric furnaces of the latest type, affording exceptional control and quality of the product. All other processes incident to rolling, shearing, pickling, finishing, etc., are equally thorough and guarded.

It is the HUMAN element that contributes most to the quality, uniformity and reliability that Jessop Products have demonstrated in a thousand applications. Jessop Craftsmen are capable, well trained and sincere in their desire to do a perfect job.

A partial list of Jessop Sheet and Plate Specialties appears on this page. But there are many more special analysis steels available. All are of tested and approved quality.

Consult JESSOP regarding your needs for sheet and plate specialties.

Established 1901

JESSOP STEEL COMPANY

HEAD OFFICE AND WORKS . . . WASHINGTON, PENNSYLVANIA

Women will wear this new MOCCASIN-TYPE Lehigh safety shoe

MOST WOMEN IN INDUSTRY need the toe-protection that *only* a steel toe shoe can give. But most women *won't wear* present safety styles because they look like old ladies' comfort shoes. ● This NEW Lehigh safety shoe looks smart with slacks or skirts. The heel is the right height for balance and comfort. The moccasin toe is easy on the feet. But concealed inside is Lehigh's rugged LOCKRIM* steel toe box that effectively shields the wearer's toes from falling tools and heavy equipment. ● Order a few trial pairs of this *smarter-looking* safety shoe today...and watch your women workers snap them up!

***STOCK NO. 700*— SELECTED OAK LEATHER SOLE** *for general industrial use. Army russet, chrome-tanned, smooth-finish side leather blucher oxford with oak leather middle sole and rubber heel toplift.*

***LEHIGH Lockrim* STEEL TOE BOX,** adapted to women's shoes, retains design that has prevented serious injury to thousands of men in industry.*

***IN STOCK**—shipped as you need them, from one pair to hundreds.* **AT ONCE DELIVERY.**

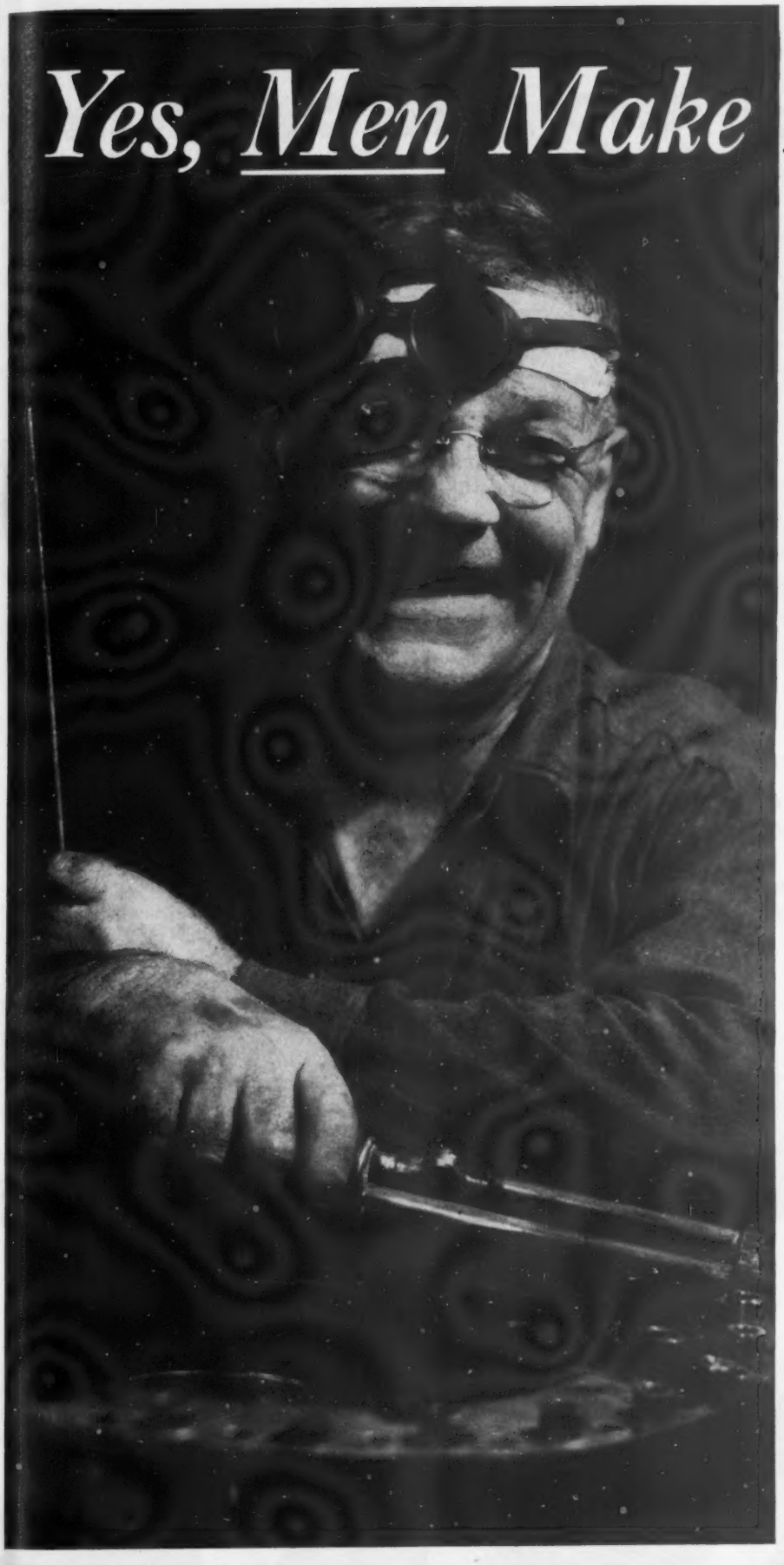
WIDTHS	SIZES
A	5 to 10
B	5 to 10
C	4 to 10
D	3 to 10

FREE! Pay envelope enclosure with ten accident case histories will convince any skeptic that safety shoes pay. No advertising. Send for sample or enough to cover your payroll.

LEHIGH SAFETY SHOE CO., INC., ALLENTOWN, PA.

*T.M. Reg.

Yes, Men Make Motors!



NO MACHINE KNOWN can duplicate the skill of Sam Meister, left, of Allis-Chalmers Norwood Works.

Holding an acetylene torch in his right hand, a silver alloy rod in his left, Sam silver-brazes end connections of Allis-Chalmers' "Indestructible Rotor."

Round and round the connections he works — expertly flowing in molten alloy to form a joined structure that can withstand as much heat as though it were a single die-casting.

No machine can do that job — and no machine can fully test how well it is done.

There's only one test . . . wait 5, 10, 15 years and *see.*

And that's the test in which Allis-Chalmers motors have proved over the years that they're *great* motors. That's why you hear it said so often: *"You can depend on Allis-Chalmers Motors!"*

• • •

YES, HUNDREDS of Allis-Chalmers men—craftsmen like Sam Meister — know they have a big personal stake in every Allis-Chalmers motor. When they build a great motor for you, they're making a *friend* . . . and they know that's something no company and its workers can have too many of.

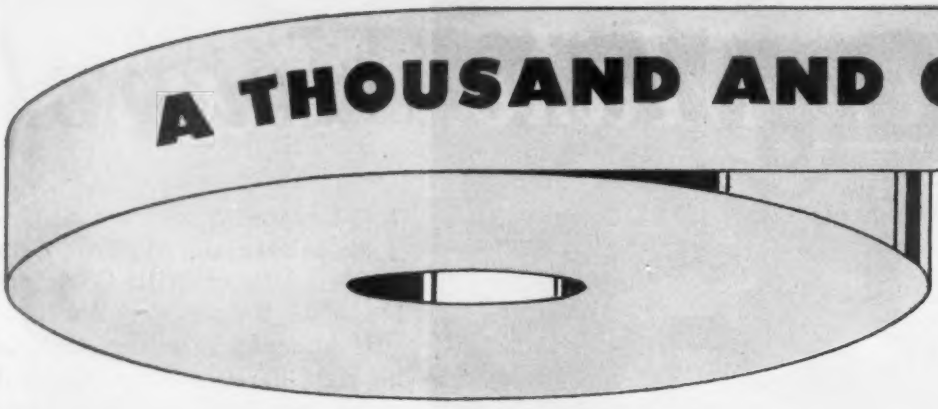
Next time *you* need great motors contact our district office. Or write direct to ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.

A 1730

WE WORK FOR VICTORY WE PLAN FOR PEACE

YOU CAN DEPEND ON ALLIS-CHALMERS MOTORS

A THOUSAND AND ONE NEW



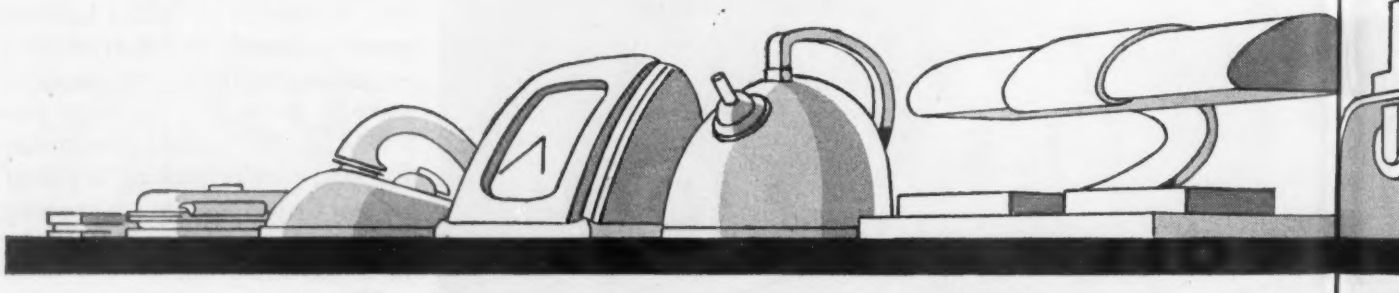
FEED ROEBLING STRIP STEEL into your shearing, forming or punching machines... watch the parts roll off in a smooth, *steady* stream. Because temper, finish, dimensions are *exactly* what you specify, there's less machine stoppage time—more output.

Trust Roebling with your needs in strip steel (available up to 10" wide) and round, flat or shaped wire. We've been making wire and wire products for over a century ...and that experience can help *you.*

Let us look over your plans. Perhaps we can make suggestions that will bring you savings. Our nearest branch office will be glad to serve you.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

WIRE ROPE AND STRAND • FITTINGS • SLINGS • ROUND AND SHAPED WIRE • SUSPENSION BRIDGES AND CABLES ELECTRICAL WIRES AND CABLES • AERIAL WIRE ROPE SYSTEMS WIRE CLOTH AND NETTING • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS • AIRCORD, SWAGED TERMINALS AND ASSEMBLIES COLD ROLLED STRIP



ROUND WIRE FLAT WIRE SHAPED WIRE STRIP STEEL WIRE

ROEB

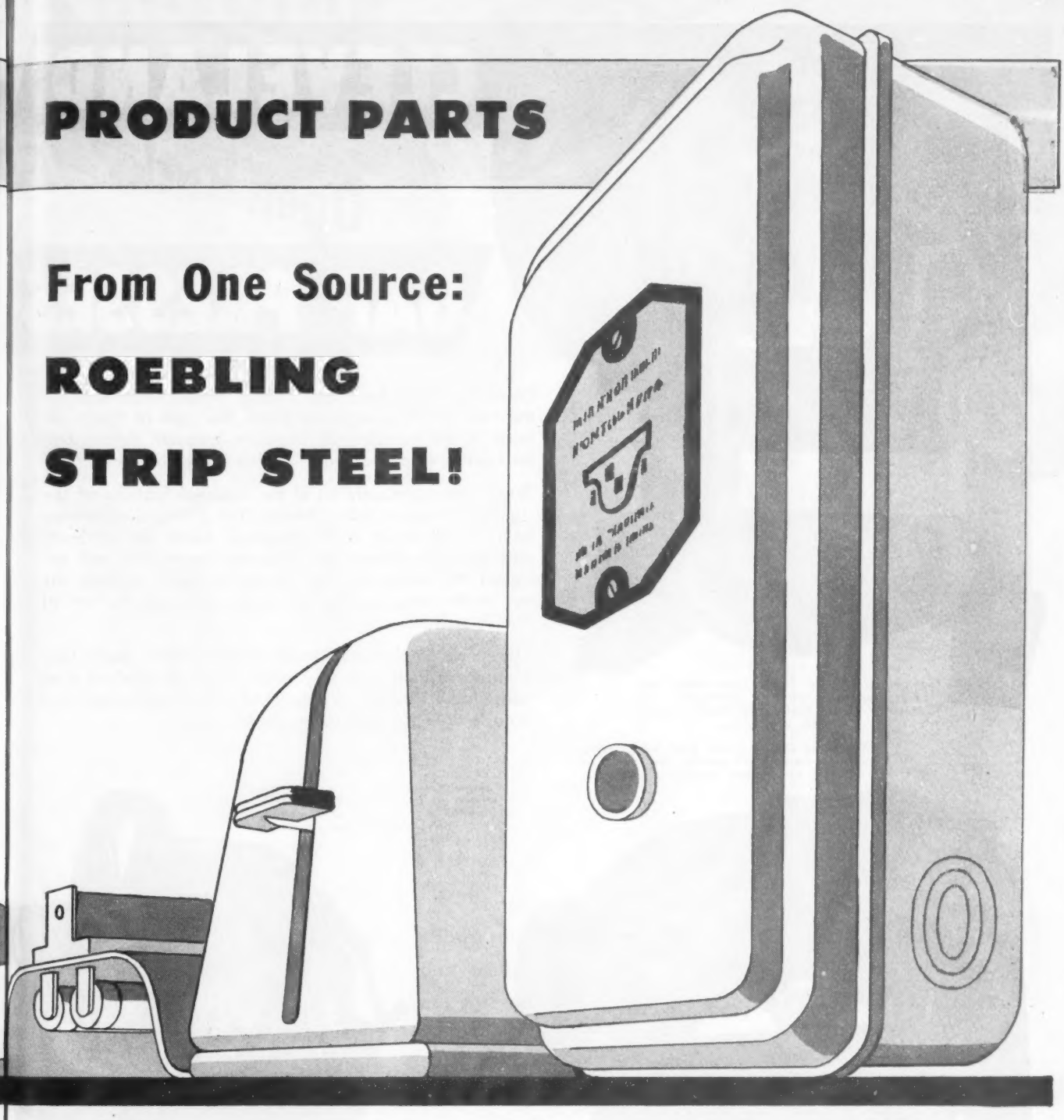
PACEMAKER IN W

PRODUCT PARTS

From One Source:

ROEBLING

STRIP STEEL!



WIRE ROPE

ELECTRICAL WIRES AND CABLES

WOVEN WIRE FABRICS

BLING

W I R E P R O D U C T S

CLEVELAND

Open Back

GAP PRESSES

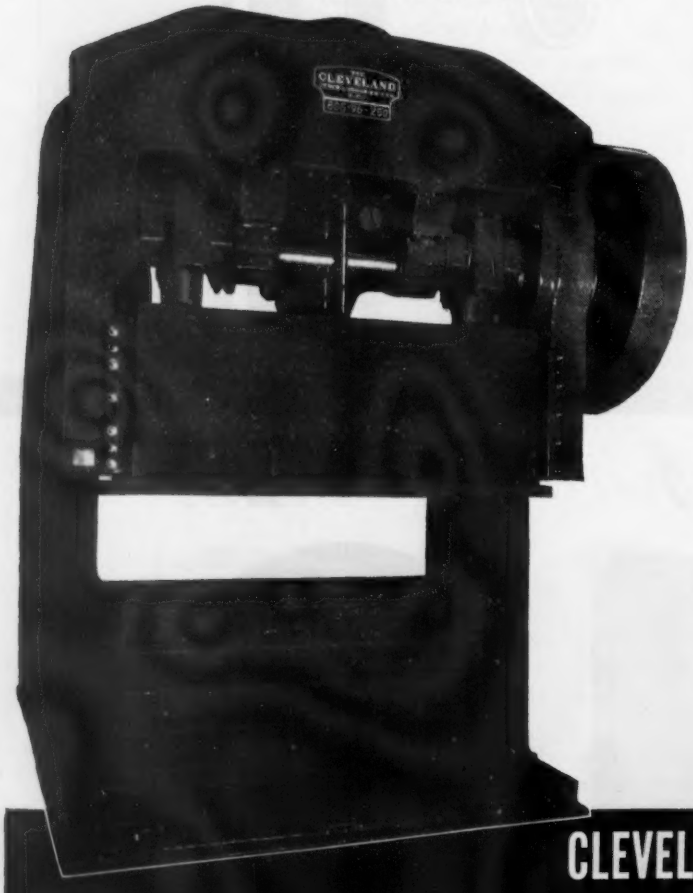
Standard Double Crank Open Back Gap Press equipped with an electrically controlled, hydraulically operated friction clutch and brake.

Cleveland Open Back Gap Presses are recommended for the very great convenience which this type of frame affords in the handling of large or irregular shapes and for feeding strip stock right and left across the dies.

These Presses embody all of the essential features of the standard Straight Sided Presses, the principal difference being in the design of the housings, which are cut back, and while the frames are ruggedly constructed and designed to withstand their maximum load without the use of tie rods, provision is made to permit the use of rods if desired.

Cleveland Single and Double Crank Open Back Gap Presses are built in a very wide range of standard sizes and can be modified in respect to stroke, adjustment, bed area, etc. to suit particular requirements.

Cleveland Double Crank Gap Press having a flush front which permits the use of a table to suit various operating conditions.



Single Crank Gap Press, permanently inclined to permit gravity discharge of the finished pieces. This is a modification of the customary upright position.

CLEVELAND PUNCH & SHEAR WORKS CO.

CLEVELAND 14, OHIO

SUPERIOR LONG TERNE

DEEP DRAWING QUALITY, Superior Long Terne steel sheets have a special analysis, open hearth steel base, tempered for accurate forming. Their lead-tin alloy coating provides self-lubrication for die work, and an excellent surface for paints and synthetic enamels.

Now widely used in war production, Superior Long Terne is fabricated into gas tanks for jeeps, ammunition cases, containers and many other parts and products. It also is used extensively in heating and ventilating equipment, farm machinery, and in other war-essential applications. Long Terne is one of a line of Superior sheets made to meet particular needs especially well. Write for more information about Long Terne and other Superior steel sheets.

LOOK FOR THIS MARK

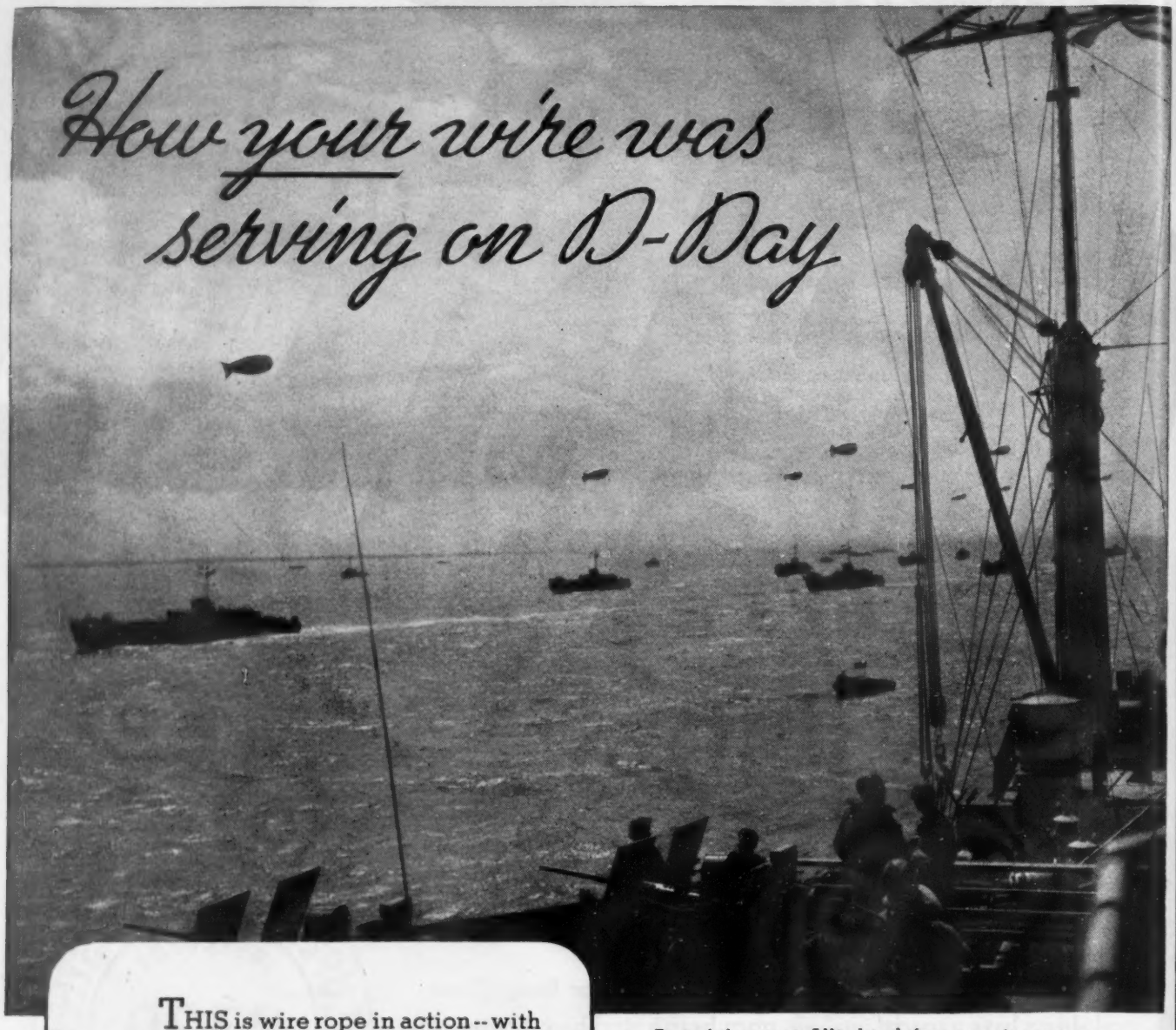
After careful inspection, a mark similar to the above is stamped on each sheet of Superior Long Terne. It is an identification and assurance of quality.

THE **SUPERIOR**
SHEET STEEL COMPANY - *CANTON, OHIO*

PRODUCERS OF STEEL SHEETS, including SUPERIOR Galvanized, Tite and Extra Tite Coat Galvanized, CHECKERCOAT, LASTI-KOTE, COPPERIOR (copper steel base), SUPERIOR Galvannealed, SUPER METAL, SUPERIOR Long Ternes (drawing quality), Hot Rolled Annealed, Hot Rolled Annealed Pickled, Pickled Blue, Deoxidized, and Standard Types of Galvanized Formed Roofing.

DIVISION OF CONTINENTAL STEEL CORPORATION • GENERAL OFFICES, KOKOMO, INDIAN

How your wire was serving on D-Day



Part of the giant Allied task force moving across the English Channel to hit the French Coast on D-Day. Official U. S. Navy photograph.

THIS is wire rope in action -- with America's invasion fleet off Normandy on D-Day. Barrage balloons tethered with wire rope to protect against enemy dive bombers! Ship's rigging of wire rope, as much as 10,000 feet per vessel! Cargo lashed to decks with wire rope! Trucks, tanks, jeeps, guns, tens of thousands of vehicles, all using wire rope! No wonder the Navy and Army have had an insatiable appetite for wire rope!

For upward of four years, the Youngstown wire mills have been producing Yolectro High Carbon Rope Wire for rope for the armed services. So if you're not getting all the Youngstown wire you need, maybe it's because the wire you wanted is going to help our boys at the front America's war needs come first. You want it that way, too!

QUALITY TRADE MARK YOUNGSTOWN SERVICE

Pipe and Tubular Products - Sheets - Plates - Conduit-Bars-Coke Tin Plate-Electrolytic Tin Plate-Rods-Wire-Nails-Tie Plates and Spikes.

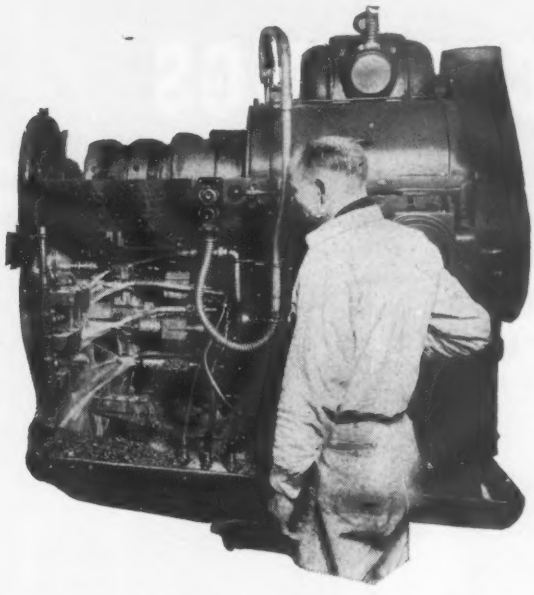
YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

YOUNGSTOWN 1, OHIO

Manufacturers of

CARBON - ALLOY AND YOLOY STEELS



We Stand Ready to Prove This Statement . . . PERFECTED LUBEWELL CUTTING COMPOUND WILL INCREASE TOOL LIFE UP TO 50% REGARDLESS OF THE MACHINE TOOL OR TYPE OF WORK BEING DONE.

To prove that tool conservation begins by adding life to tools through proper lubrication, G. Whitfield Richards will ship you any quantity of Perfected Lubewell, and if you do not find that it: 1. Increases tool life up to 50%; 2. Increases machine production up to 25%; 3. Gives a superior finish and closer tolerances; 4. Lowers cutting lubricant cost as much as 40%... then you may tear up the bill.... Phone, write or wire a trial order of Perfected Lubewell. Try it on your toughest job.

G. WHITFIELD RICHARDS

PIONEERS OF *Water Soluble Cutting and Drawing Lubricants*

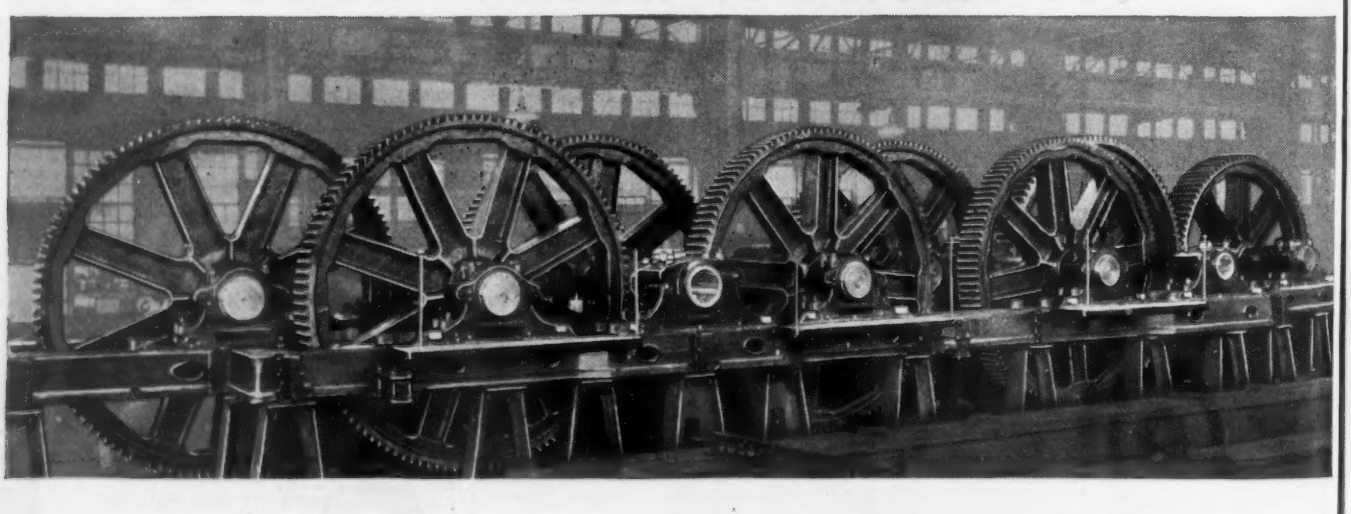
1738 CARLTON STREET · PHILADELPHIA 3, PA.

CONTINENTAL
STEEL CASTINGS

Heavy mill gears cast by Continental—12 feet in diameter and each weighing 20,000 pounds form the gear train shown below.

Continental carbon and alloy steel castings, recognized for dependability, are the result of production "know how" and continuous research for improved castings.

Other Continental products include rolls, rolling mill equipment and special machinery.



CONTINENTAL FOUNDRY & MACHINE COMPANY

CHICAGO • PITTSBURGH

CHICAGO WORKS, EAST CHICAGO, INDIANA
PITTSBURGH WORKS, CORAOPOLIS, PA. • WHEELING WORKS, WHEELING, W. VA. • WARWOOD WORKS, WHEELING, W. VA.

Good companies settle here . . .

and stay!

Today, as always, Southern New England is the heart of the world's richest, most highly-concentrated market . . . the best of all reasons why industry should—and does—make this its home.

Draw a circle 500 miles from the center of Southern New England and you will include 58,000,000 consumers. Into that circle, Southern New England pours not only consumer goods but its producer commodities—machinery, tools, ball bearings—the parts and equipment that keep other industries going.

Beyond that circle looms the great world market of tomorrow . . . a market that will be served most efficiently by Southern New England's strategically located ports.

Southern New England has its personal appeal, too. For with its many delightful residential communities, its hills, lakes, and sandy beaches never more than a few miles from where you work, Southern New England is a great place to live and play.

As you weigh the future of your new or expanding business, consider Southern New England.

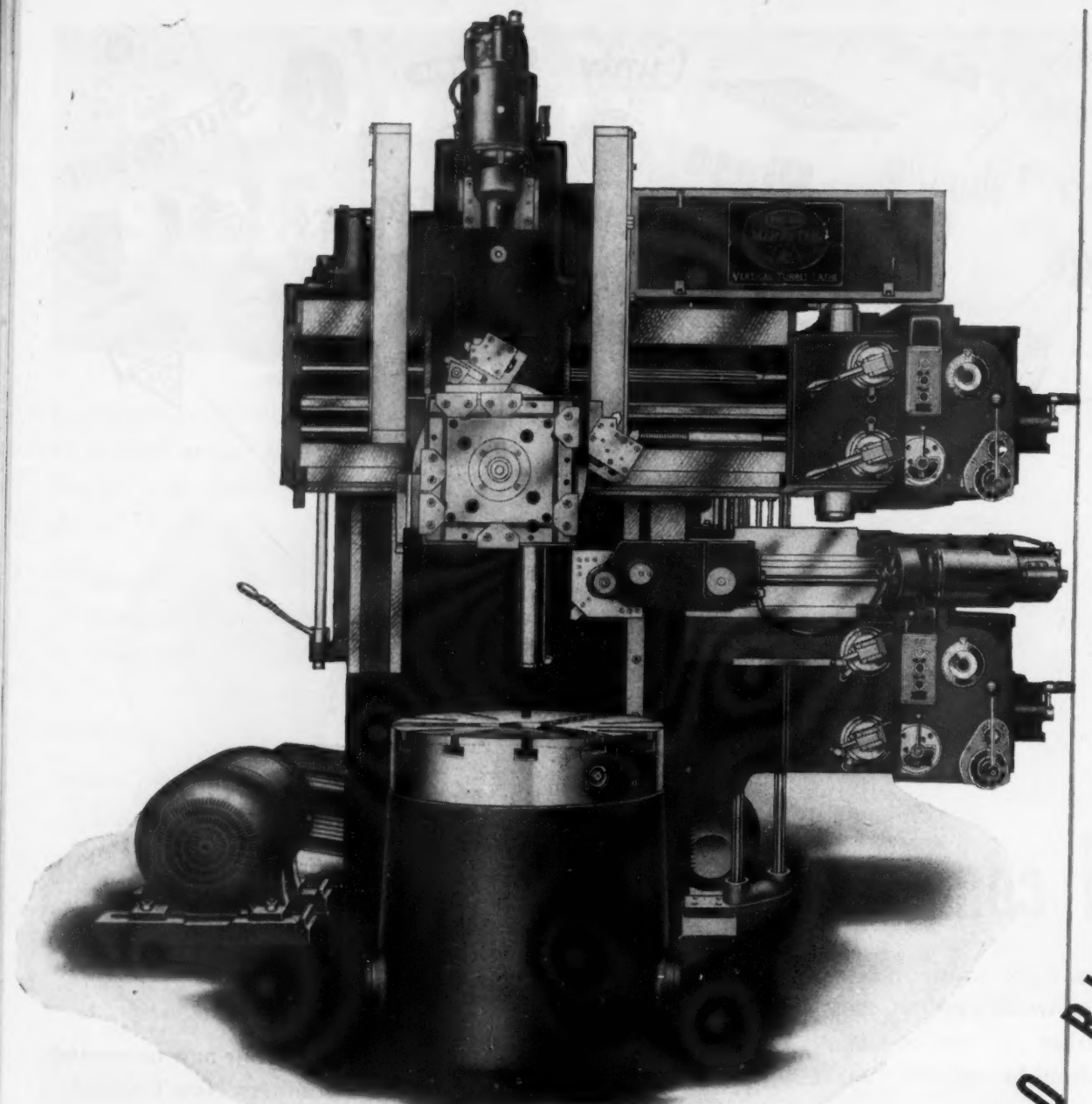
Search where you will, you won't find a more favorable spot . . . *anywhere.*

For your business and personal postwar planning, we offer an industrial booklet in full color: "Southern New England for Tomorrow's Industry". This booklet is yours for the asking. Write to P. E. Benjamin, Manager of Industrial Development, The New Haven Railroad, 80 Federal Street, Boston 10, Mass.

This is one of a series of advertisements presenting the industrial advantages of Southern New England.

THE NEW HAVEN R.R.

Serving **SOUTHERN NEW ENGLAND** *with a network of rail and highway transportation that puts every manufacturer* ON THE MAIN LINE.

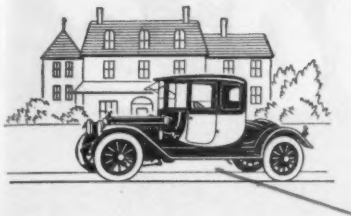


BULLARD

MAN-AU-TROL

MASTER OF THE MACHINE

TOO POOR OR TOO RICH



IS USUALLY A MATTER OF PRICE

Only the rich rode in automobiles in 1910

Even the poor were riding in 1940

Yet most of the poor were no "richer"

Permitting more people to enjoy what Industry has created is the essence of America's high standard of living. It has come about *partly* because their wages have been increased . . . *mostly* because prices have been reduced to meet their wage levels.

You can easily verify that. Records show that, during the years of the greatest advance in American living standards, the cost of goods *decreased* by a greater percentage then wages *increased*. That more people had more things to enjoy was less a matter of having more money to spend than of goods costing less to buy.

And how were the costs of goods lowered?

By more efficient manufacturing methods . . . by the same means that can be employed by Industry . . . by you . . . as America comes out of this war.

Making machines do more is the essence of efficient production. That is why Industry is welcoming the Bullard Man-Au-Trol principle of Automaticity as enthusiastically *today* as manufacturers in the past have greeted every other outstanding Bullard manufacturing method. Man-Au-Trol, for the first time in machine tool history, makes an automatic machine as flexible as a multi-purpose, manually-operated machine. With it, Industry can take great price-lowering strides toward making the poor richer . . . and markets more secure.

HOW THE BULLARD MAN-AU-TROL VERTICAL TURRET LATHE LOWERS UNIT PRODUCTION COSTS

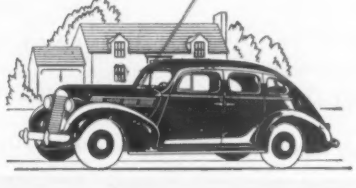
1. LIGHTENS LABOR'S LOAD: The operator goes once through the machining cycle manually, setting the best production method into an automatic cycle. Then he merely loads, supervises and unloads while the Man-Au-Trol does the work.

2. MAKES AUTOMATICITY VERSATILE: It automatically machines any and all work which the Vertical Turret Lathe can handle when operated manually. Is instantly convertible for manual operation on the same piece or an entirely different piece without affecting the automatic cycle for which it is set.

3. SAVES SET-UP TIME: Unlike so many other automatic machines, its set-up time from one class of work to another is only slightly more than a manually-operated machine.

4. REDUCES SALVAGE COSTS: It machines day after day with a degree of accuracy impossible under manual operation because it eliminates human and cumulative error.

For additional facts about the way the new Bullard Man-Au-Trol Vertical Turret Lathes minimize tool investment, reduce machining time and other manufacturing costs, write for Bulletin A—today. The Bullard Company, Bridgeport 2, Conn.



BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE

"FERROCARBO"-S

improves quality of fine-grained steels

● New ladle treatment reduces and disperses inclusions

DEOXIDATION by "FERROCARBO"-S of steels to which grain-refining agents have been added reduces the number and size of inclusions, and more uniformly distributes the remaining ones throughout the mass of steel—the result being a decided improvement in the steels' properties. And "FERROCARBO"-S does not interfere with the action of addition materials used for grain-refining.

Typical of the improvement caused by "FERROCARBO"-S treatment of fine-grained alloy steels are these average results on 60 heats, half with "FERROCARBO"-S, and half without:

Ladle Practice	Yield Strength	Ultimate Strength	Elongation in 2"	Reduction of Area Transverse	Quality Factor*
Conventional	99,990	118,700	14.5	38.9	108.0
"FERROCARBO"-S	99,500	120,800	15.4	44.7	124.2

*Empirical formula for evaluating quality of steel

Further studies of these steels, including step-down and macro-etch tests, proved that the "FERROCARBO"-S treatment removes nearly all the stringer-like inclusions, and leaves the remaining ones in compact globular form, well dispersed.

Using "FERROCARBO"-S at the ladle brings these extra benefits: *thorough deoxidation; inclusions reduced —uniformly distributed—stringers eliminated; prolonged increase in fluidity; added ductility;* and, under controlled conditions, *increase in hardenability.*

Let our metallurgists show how "FERROCARBO"-S can be used in your operation to provide these advantages. Write to:

THE CARBORUNDUM COMPANY
Refractories Division, Dept. R-7
Perth Amboy, New Jersey

"FERROCARBO" distributors are:
KERCHNER, MARSHALL & COMPANY,
Pittsburgh, Cleveland and Birmingham
MILLER and COMPANY, Chicago, St. Louis and Cincinnati

"CARBORUNDUM" and "FERROCARBO" are registered trade marks of, and indicate manufacture by, The Carborundum Company.

Ferrocarbo by CARBORUNDUM TRADE MARK

NEW GREASE STANDS UP UNDER ALL THESE CONDITIONS!

Temperatures from Freezing to 350° F.

If using just one grease will be an advantage in your plant, here's the answer—Gargoyle Sovarex Grease. This one unique product is an all-purpose grease for plain bearings. It resists softening and is being successfully used in bearings at temperatures of over 350° F.

Light to Heavy Pressures!

You'll find that Gargoyle Sovarex Grease combines the best features of both lime and soda-base greases. It serves under light to heavy pressures, and stays on the job where other greases fail. You can apply it with grease guns, mechanical applicators or any way that grease can be applied.

Water from Cold to Boiling!

Many greases withstand cold water. But Gargoyle Sovarex Grease resists the washing, melting action of hot water, even boiling water. It is also unusually resistant to dilute alkali and acid solutions. Your Socony-Vacuum Representative will be glad to give you detailed performance facts and figures and help you apply this new grease throughout your plant.

SOCONY-VACUUM OIL COMPANY, INC.
Standard Oil of N.Y. Div. · White Star Div. Lubrite Div. · Chicago Div. · White Eagle Div. Wadhams Div. · Magnolia Petroleum Co. General Petroleum Corporation of California.

SOCONY-VACUUM'S 5 Steps to Lower Production Costs:

1. Lubrication Study of Your Entire Plant
2. Lubrication Schedules and Controls
3. Lubricant Storage and Handling System
4. Skilled Engineering Counsel
5. Progress Reports of Benefits Secured

GARGOYLE Lubricants

Has Greatest Strength Per Unit of Weight

Recognized as the strongest construction for a given weight of metal, the tubular form is preferred for structural uses wherever loads are imposed from all directions or wherever twisting strains are to be resisted. Typical examples are engine mounts, frames, torque tubes, and structural members.

Michigan seamless steel tubing excels for such uses because of its great strength in relation to weight, because it is easily fabricated and serviced. In Michigan tubing mechanical properties are controlled in production to meet exacting structural requirements.

Michigan technical counsel is available on all applications of tubing.

COLD-DRAWN SEAMLESS STEEL TUBING

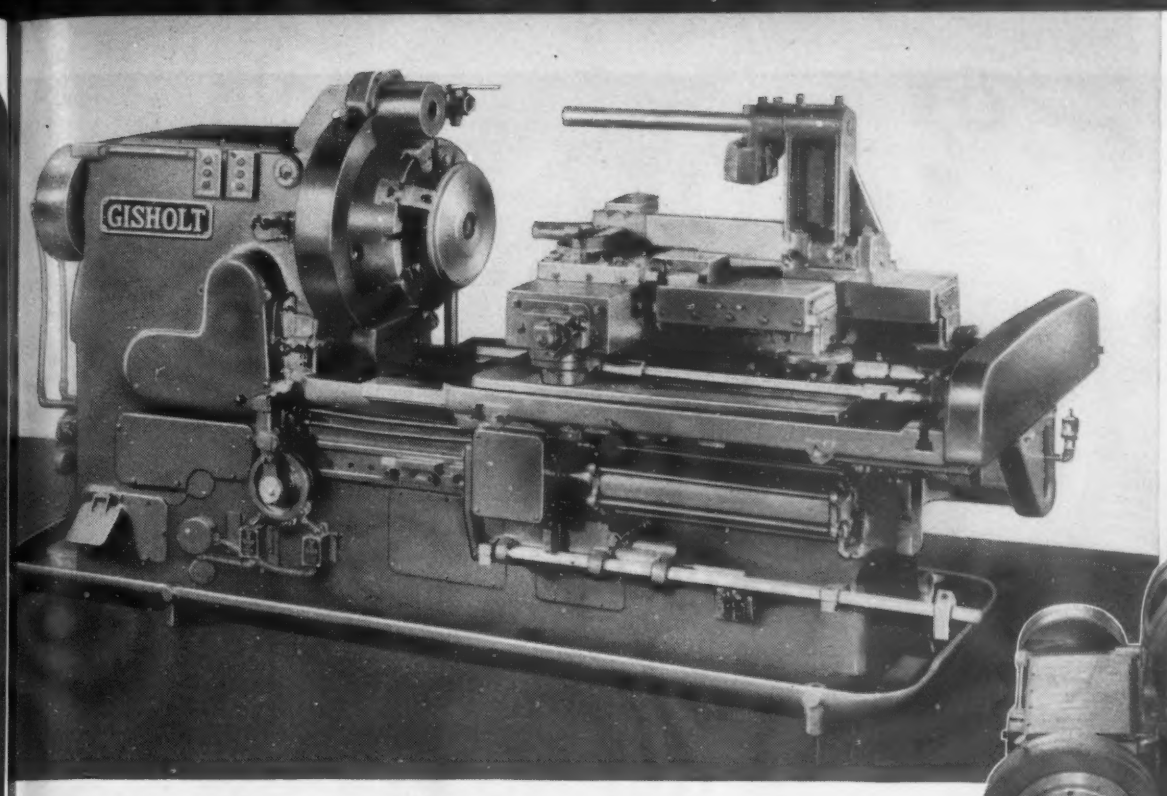
AIRCRAFT • MECHANICAL • PRESSURE • STRUCTURAL

MICHIGAN SEAMLESS TUBE COMPANY

SOUTH LYON • MICHIGAN

ARMY E NAVY

Awarded Feb. 12, 1943
First Star Sept. 9, 1943
Second Star May 27, 1944
Third Star Dec. 2, 1944



YOU CAN "STRETCH" THE SIMPLIMATIC, TOO!

Yes, one of the most interesting facts about the Simplimatic is its remarkable adaptability. With the simple basic design which provides freedom from the usual restrictions, it permits the use of a greater number of tool slides, each favorably placed, each favorably cammed for its own particular cut. Thus, the machine may be individualized to solve a variety of problems. And, in each case, you enjoy the high speed production and lower costs of an automatic machine designed specifically for the job.

A typical example of this is shown at right. Here, on an extended bed, one simple cammed tool slide moves six tools through a blended turning cut on a long cylindrical piece. Two other slides face the ends. Cammed rollers behind the six tool holders move the tools transversely. A sliding pneumatic tailstock facilitates mounting the piece.

The simple adaptability of this rugged, high speed automatic lathe may solve your problems as it has hundreds of others. Ask for all the facts about the Gisholt Simplimatic.

GISHOLT MACHINE COMPANY
1217 E. Washington Ave., Madison 3, Wis.

GISHOLT

Look Ahead . . . Keep Ahead . . .
With Gisholt Improvements in Metal Turnir

TURRET LATHES • AUTOMATIC LATHES • BALANCING MACHINES • SPECIAL MACHINES

Your SPECIAL THREADED PARTS
are made faster, with precision accuracy
by CLEVELAND Top Quality
METHODS
★ You may be surprised to find that some parts you've usually made on screw machines can be produced to better advantage, in production quantities, by cold forming. Making your special headed and threaded pieces by our Kaufman Process guarantees a stronger, tougher product—accurate in every dimensional detail. This method is faster—therefore more economical. The heat treatment you specify can be provided by our modern electric equipment. Send your blue prints for information and prices.

CLEVELAND *Top Quality* **FASTENERS**

The Cleveland Cap Screw Company

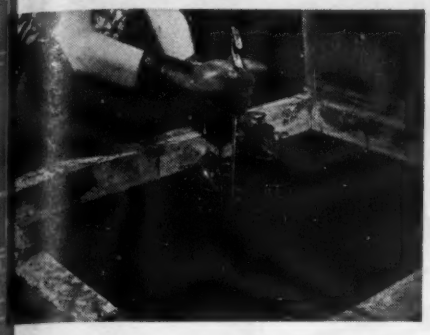
2917 EAST 79TH STREET • CLEVELAND 4, OHIO

Warehouses: Chicago, Philadelphia, New York, Los Angeles

Ask your Jobber for Cleveland Fasteners

MADE BY THE ORIGINATORS OF THE KAUFMAN PROCESS FOR GREATER STRENGTH AND ACCURACY

15 to 60 Seconds' immersion . . . by hand or automatically . . . gives lasting Iridite protection. Products may be Iridited in single racks, or in bulk.



Hot-Water Rinse, standard with Iridite, speeds drying. No special equipment is needed for Iridite process, other than an acid-proof tank to hold the solution.

Easily Dried in a few seconds, either by hot blast centrifuge or oven, parts may be handled, packed or shipped as soon as dry. Iridite process is fast, easy.

Send for test panel and see how IRIDITE

Balks Corrosion of Zinc and Cadmium

. . guards all galvanized, plated and die-cast zinc surfaces!

WANT a fast, sure way to head off corrosion on zinc die cast, zinc or cadmium plated or galvanized surfaces? Use Iridite! Iridite goes on with a quick dip of 15 to 60 seconds . . . serves as either a final finish or paint base.

In Wide Use

Used throughout industry, the Iridite process meets Army-Navy Aeronautical Specification AN-P-32A, Army Ordnance Specification 57-O-2C, Navy Ordnance Specification OS-1374 and is used by such leading manufacturers as Bulova, Pyrene, Sparton, York, Anaconda and many others.

Test Iridite Yourself

Send for free test panel, half of it protected by Iridite. Prove for yourself how Iridite balks corrosion . . . how the Iridite treatment does not alter dimensions of finely machined parts . . . how Iridited parts may be cold worked without flaking, chipping or peeling.

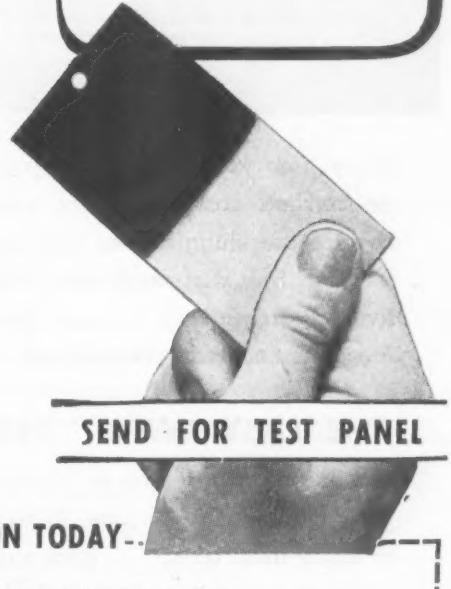
Find out whether Iridite is the ideal "finishing touch" for your present or postwar product. Write today for your test panel. Address: Rheem Research Products, Inc., 14208 Standard Oil Building, Baltimore 2, Maryland.

3 WAYS TO BUILD PROFITS WITH IRIDITE

1 *As a final finish,* Iridite is available in a variety of attractive colors.

2 *As a paint base,* Iridite holds paint or clear lacquer firmly, even on newly galvanized surfaces.

3 *To reduce costs,* consider using galvanized, plus Iridite, in place of more expensive metals.



SEND FOR TEST PANEL

RHEEM RESEARCH PRODUCTS, INC.

IRIDITE

Standard Oil Bldg., Baltimore 2, Md.

Reg. U.S. Patent Office

Branches—570 Lexington Ave., New York 22; 20 E. Jackson Blvd., Chicago 4; 2411 Sichel St., Los Angeles 31. Distributors in: Waterbury; Grand Rapids; Detroit; Cleveland; Los Angeles; Long Island City; St. Louis.

MAIL COUPON TODAY

RHEEM RESEARCH PRODUCTS, INC.
14208 Standard Oil Building
Baltimore 2, Maryland

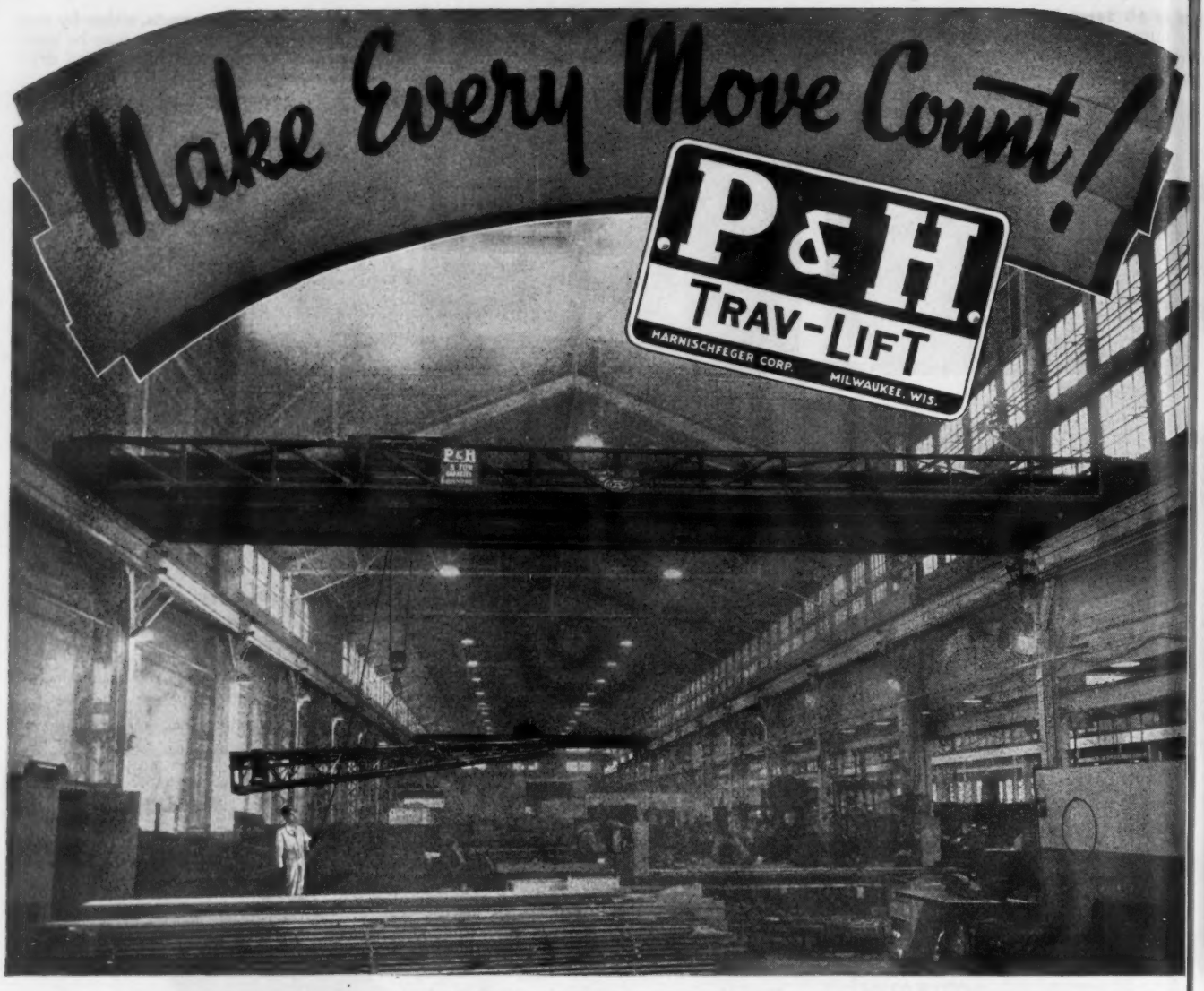
Gentlemen: Please send me a free panel of Iridite-treated zinc plate for laboratory testing and full information and operating details.

Name.....

Company.....

Address.....

Keep faith with your fighters and yourself—Buy War Bonds for Keeps

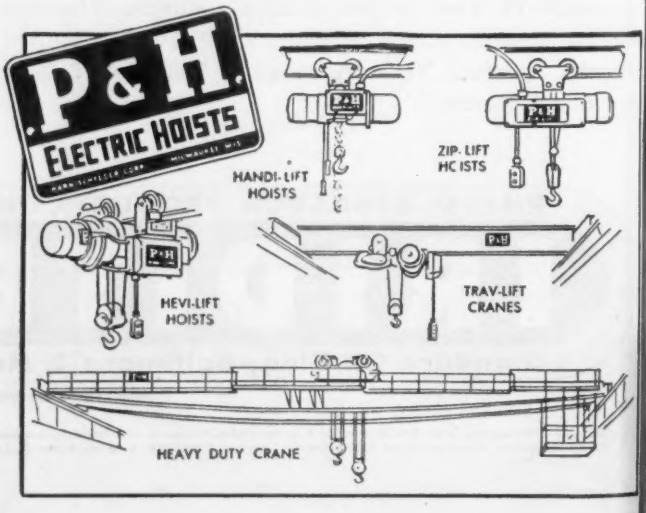


Every time you handle your product, you add to its finished cost. So make every move count! Beware the sluggishness that comes with human fatigue. See that work for skilled hands is delivered promptly . . . and promptly removed. Avoid unnecessary rehandling.

THE EASY WAY: "THRU-THE-AIR"

The easy *low cost* way is "thru-the-air." Whatever your loads, up to 15 tons, there's a P&H Trav-Lift to move them *direct* . . . from any point to another within the area served . . . and all with the pressing of buttons! One operator does the job, without delay, without effort—*and without rehandling!*

Electrically-operated Trav-Lifts are available with either floor or cage control. You may choose from a wide range of types and capacities. Call your P&H Hoist Engineer . . . or write us for literature . . . and learn how Trav-Lifts can help *you* "make every move count!"



P&H

ELECTRIC HOISTS

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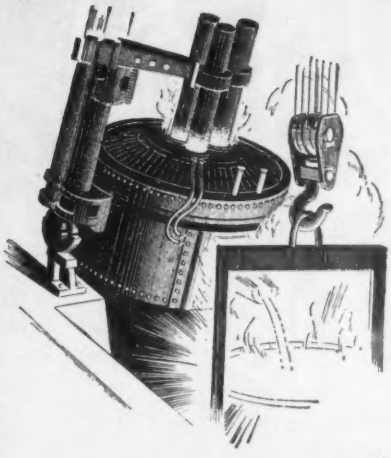
Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION

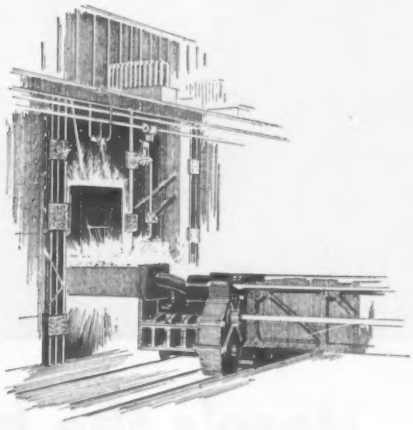
HOISTS • WELDING ELECTRODES • MOTORS • P&H • EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

Practical Men to Give Practical Help Where Alloy Steels are Made and Used



Electromet field men, because of their broad steel-plant experience, are frequently asked to help solve difficult steel problems. They are located in every major steel-making center. They talk the steelmaker's language and understand his problems.

These field metallurgists can advise on the selection and best use of the sizes and grades of ferro-alloys available. They are familiar with a wide group of alloys; they do not have one "stock" answer for all problems. And their experience is backed by an extensive research program in the development of better alloy steels.



In your design-engineering department, Electromet metallurgical engineers are prepared to help solve specific problems in the selection, fabrication, or use of alloy steels — especially stainless steels. If you have a problem in the use of alloys or alloy steels, call on Electromet. Further information about this service and brief descriptions of Electromet ferro-alloys and alloying metals are found in the booklet, ELECTROMET PRODUCTS AND SERVICE. Write for your copy.

BUY UNITED STATES WAR BONDS AND STAMPS

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

ELECTROMET Ferro-Alloys and Metals
are sold by Electro Metallurgical Sales Corporation, and
Electro Metallurgical Company of Canada, Limited, Welland, Ontario

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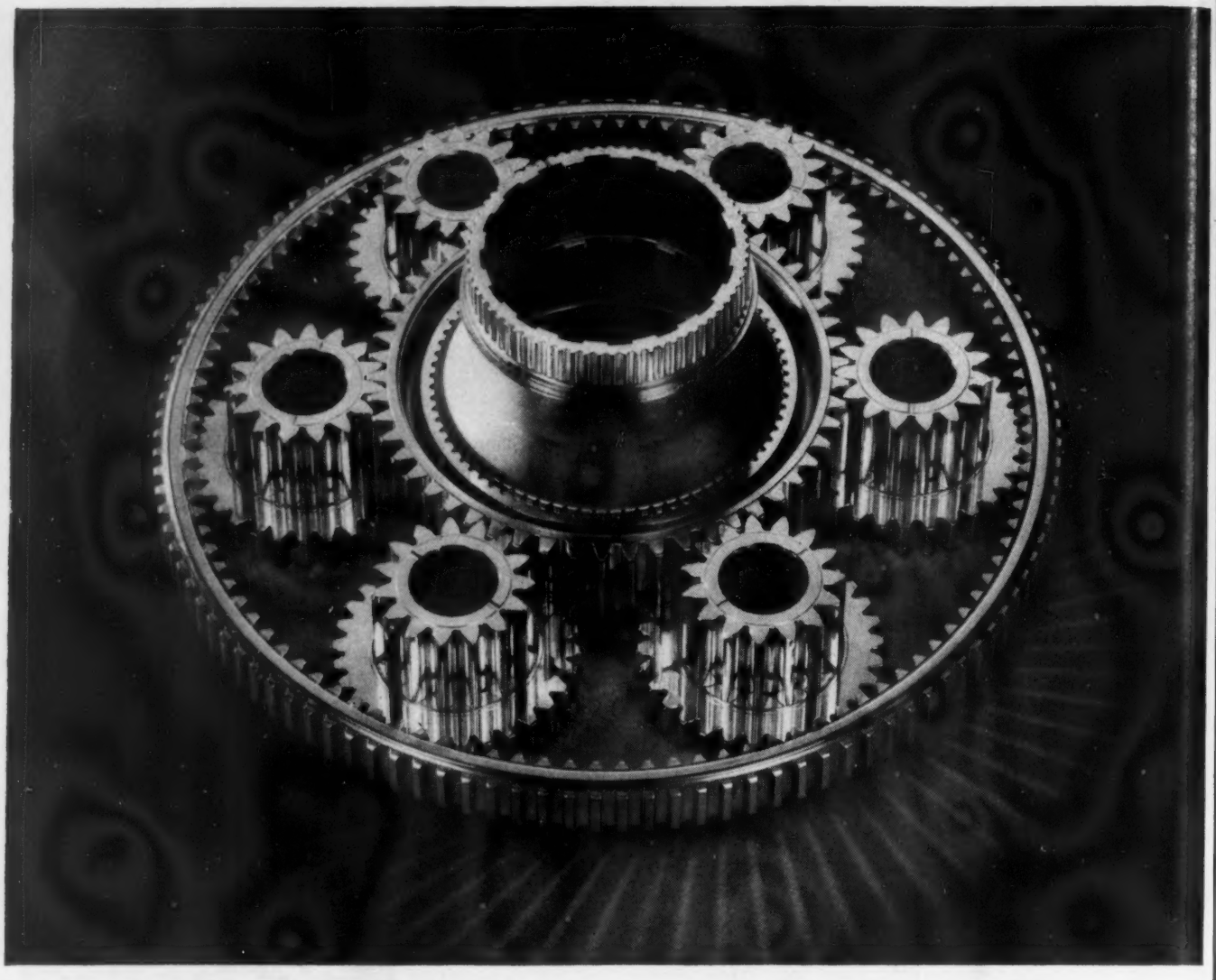


Here's the heart of a mighty engine

You are looking at the transmission of a giant aircraft engine. Delicate as these gears seem, they possess the tough strength and endurance to carry a mighty bomber on its thousand mile mission—and back—time after time. This dramatic coupling of rugged strength and light weight—of mighty power and compactness is made possible by new gear production methods developed by Foote Bros.

The big miracles these revolutionary type gears perform are due to the extremely close tolerances to which every dimension is held—to the unique developments in heat-treating that assure the proper hardness of every part—to the extraordinary control of every step in production that permits their manufacture in quantities even though specifications demand laboratory precision.

These new A-Q (Aircraft Quality) gears are already suggesting revolutionary changes in many peacetime machines. They are permitting smaller, more compact design—they are making possible greatly increased operating speeds—they are assuring longer life to machines and equipment on which they are used.

Designers and production engineers interested in the possibilities of these new gears will find complete data on them in a bulletin recently issued by Foote Bros. Write for a copy of Bulletin A-Q-A. It will be sent to you upon request.

* * *

FOOTE BROS. GEAR AND MACHINE CORPORATION
Dept. X, 5225 S. Western Boulevard • Chicago 9, Ill.

This engineering bulletin on A-Q gears gives complete engineering data, comparative performance curves, design details and other information on this revolutionary type gearing.

FOOTE BROS.

Better Power Transmission Through Better Gears

EVEN THE *Worrybird* CAN'T WORRY ABOUT THIS MOTOR

Can't worry about premature breakdown.

The Crocker-Wheeler Protected-Type Motor is built to last. Frame and shields have no openings above the horizontal center line, which means that dripping liquid and falling metal chips won't get in to damage the interior working parts. Vinylastic insulation makes coils dirt, oil, and moisture resistant to a high degree. Phase insulation provides added protection. Dynamically balanced, ALUCAST rotor is practically indestructible.

Can't worry about maintenance.

Patented bearing seal for ball bearings (sleeve bearings are optional) is so effective that re-greasing is required only once a year or even less frequently. This seal permits use of softer grease for better lubrication and longer bearing life.

Can't worry about first cost.

Despite all these advantages, Protected-Type Motors cost no more than conventional open types. They combine added protection with the surplus capacity (40C rise with a 15% service factor) of the open motor.

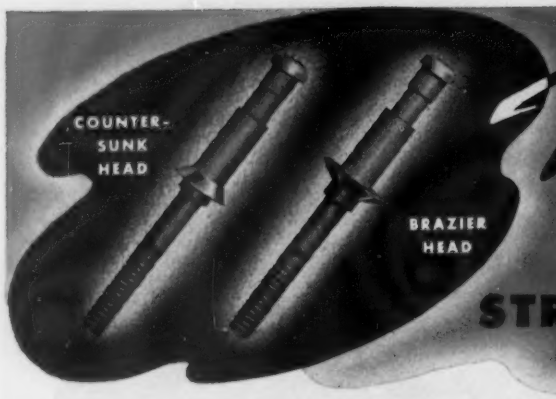
Why not investigate the many advantages of this new motor—to see if you can't end your own worries? Send for your FREE copy of descriptive bulletin, DL-121, that shows how these motors are protected, where they should be used, why they will give long trouble-free service. Write today—no obligation.

CW-1

CROCKER-WHEELER

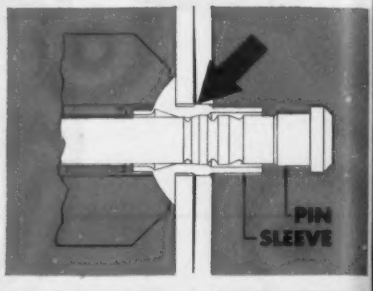
A DIVISION OF JOSHUA HENDY IRON WORKS, AMPERE 33, NEW JERSEY

Branch Offices: BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • SAN FRANCISCO • WASHINGTON



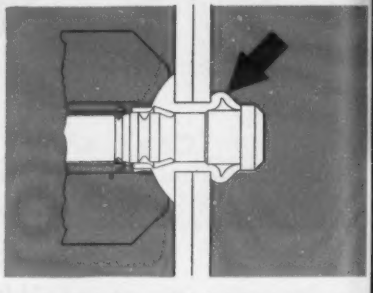
How the HUCK BLIND RIVET WORKS . . . AND WHY IT'S STRONG . . . SAFE . . . ECONOMICAL

HUCK Blind Rivets are unusually strong, safe and dependable—and economical, too, even on jobs where ***conventional*** rivets might ordinarily be used. The "inside" story of the way they work shows the reasons behind these advantages.



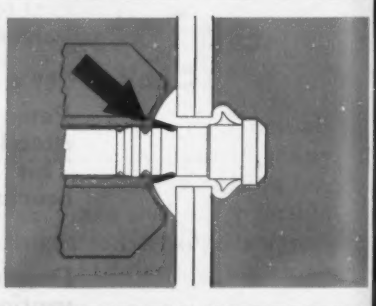
1 positive shank expansion

At the start of the driving operation, the pneumatic rivet gun pulls tapered shoulder of pin through a smaller-diameter hole in the sleeve, ***positively expanding the sleeve to fill the hole.*** (Drawing at right shows this step approximately half completed.) This assures a ***rigid, fatigue-resistant joint*** capable of withstanding vibration and reversals of stress.



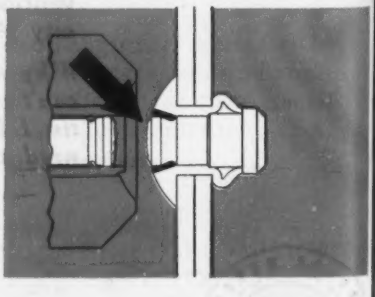
2 bulbed blind head formation

Next, as the pull on the pin continues, the sleeve is squeezed between the head of the pin and the outer anvil of the gun. The sleeve end upsets to form a ***bulbed head*** rather than flaring out into a tulip head. This action pulls the sheets tightly together; also provides ***adequate surface contact*** between blind head and sheet, resulting in ***great strength and rigidity.***



3 positive mechanical lock

The inner anvil of the rivet gun then automatically forces the locking collar at the outer end of sleeve into the conical space shown at right, ***rigidly and permanently locking the pin to the sleeve.*** This positive lock gives the rivet a strength comparable to that of a ***solid*** rivet; also ***precludes all possibility of the pin working out.***



4 pin break, flush with head

Finally, the pin is broken off in tension substantially ***flush with the head of the sleeve.*** There is ***no projecting end*** left to be cut off in a separate operation. . . The steps here outlined all automatically follow in proper sequence, and the whole driving operation requires only an instant.

Free ***ILLUSTRATED MANUAL*** gives full details, including complete working data. Write for Bulletin 451.

Huck MANUFACTURING CO.

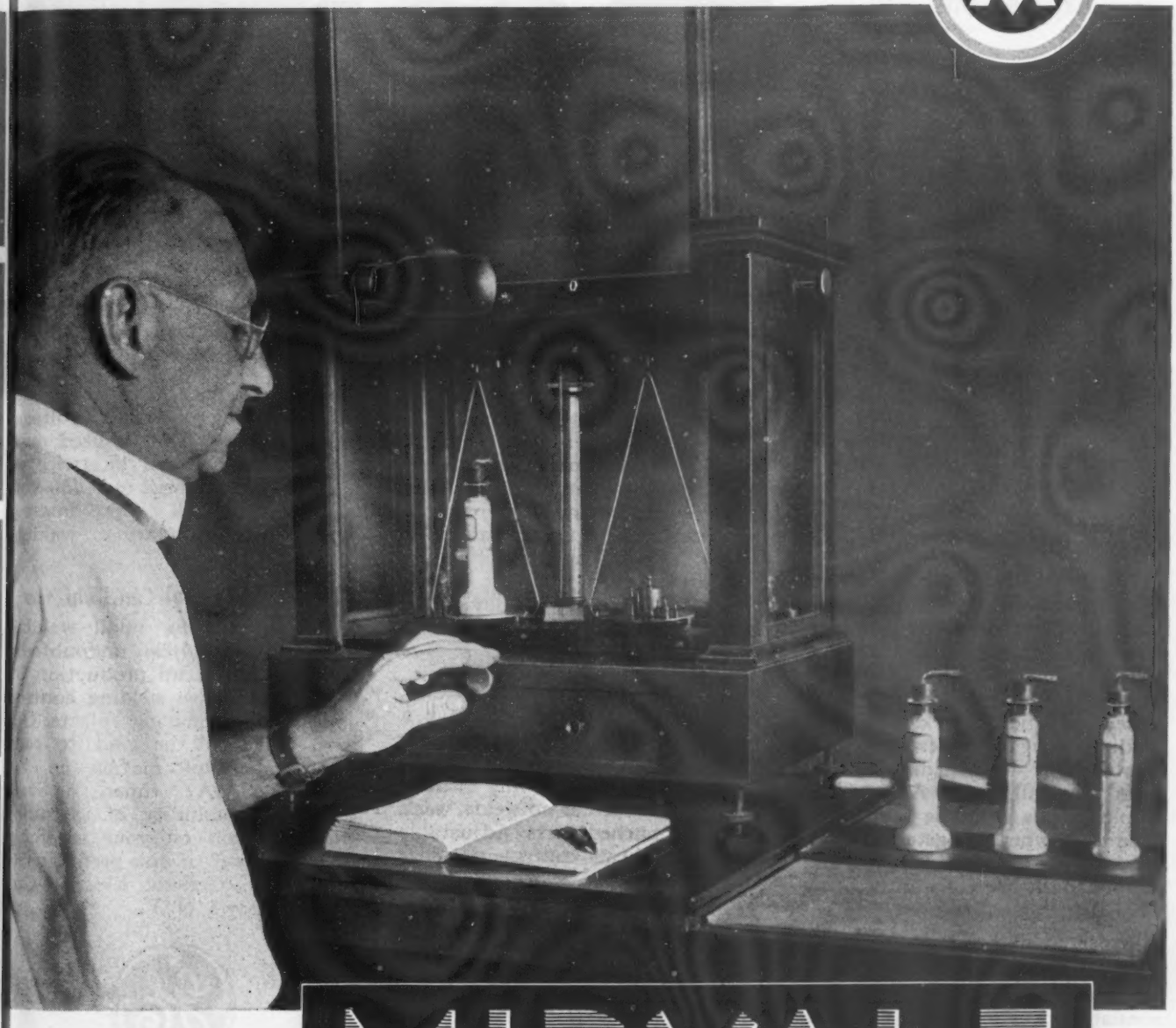
2480 BELLEVUE AVENUE DETROIT 7, MICHIGAN

MIDVALOY STAINLESS BARS

Experience accumulated since the first Midvaloy stainless bar was shipped in 1916, is used daily at Midvale in the manufacture of many varieties of heat and corrosion resisting stainless steel bars. All of the common types are made, as well as many special ones. Strictest "nth degree" laboratory control and the great technical skills of our expert staff keep Midvale quality high. Our technicians are available for consultation — and our modern rolling, forging and finishing facilities invite your inspection.

THE MIDVALE COMPANY • NICETOWN • PHILADELPHIA

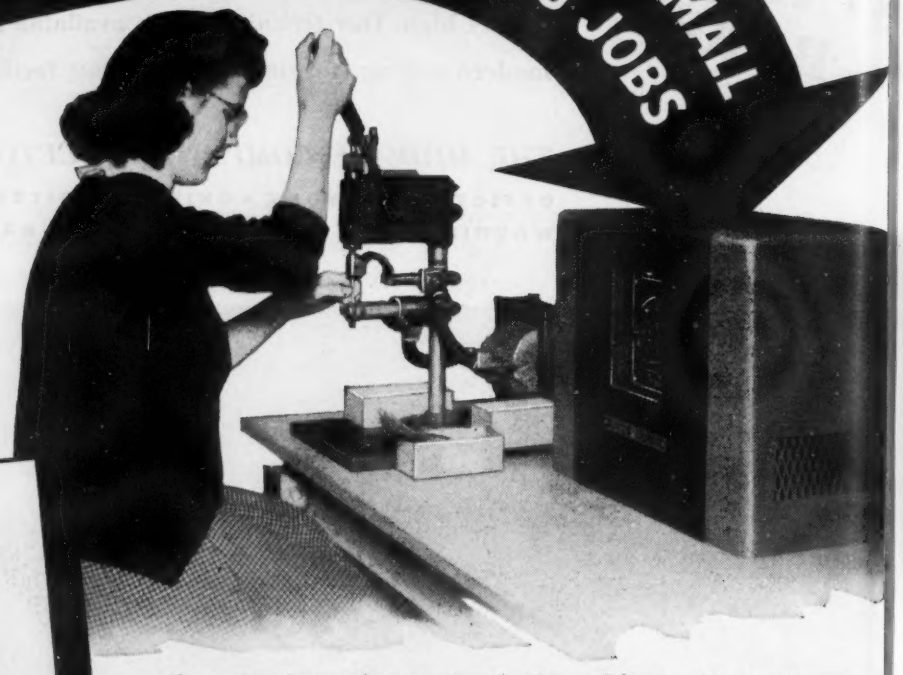
OFFICES: NEW YORK • CHICAGO • PITTSBURGH
WASHINGTON • CLEVELAND • SAN FRANCISCO



MIDVALE

Custom Steel Makers to Industry

New ELECTRONIC CONTROL FOR SMALL RESISTANCE-WELDING JOBS



This new G-E electronic heat control used with a small bench welder is an important factor in the high production rate attained in the welding of electronic tube parts.

WHAT IT OFFERS YOU

1. Synchronous Precision Timing
   a. Easy, accurate adjustment
   b. Uniform results
2. Electronic Heat Control
   a. High production
   b. Little or no distortion of material
   c. Satisfactory welding of small difficult-to-weld parts

NOW you can be certain that your low-capacity spot welders will be precisely controlled, insuring better welding results. When connected to a suitable transformer, this control, used either on a bench welder or with welding tongs, makes an ideal combination for welding of all sorts of small parts. A good example of this is in the welding of tube parts where tungsten, fernico, copper, tantalum, magnesium, and molybdenum are constantly being welded with good results.

Synchronous Precision Timing

You know that accurate control of weld time is essential to the consistent welding of small parts, because the optimum weld time for high production and little distortion is less than ten cycles. In fact, it is often only one or two cycles.

Synchronous precision timing enables you to adjust the weld time in one-cycle steps from one to ten cycles. Also, with this type of timing you are assured that the preset timing will be exact (no deviations from weld to weld).

Electronic Heat Control

You also know that, in welding small parts, it is vital to have a means of adjusting the current to very close values, as relatively slight changes in welding current will result in either no welds, weak welds, or burned parts. Adjustable electronic heat control provides the necessary preciseness of current control for welding small parts—especially those metals and alloys which are difficult to weld consistently.

Flexibility of Operation

This equipment is suitable for operation on either 230- or 460-volt, 60-cycle power supply. Because the tubes have the same current rating on either voltage, the transformer that is used on a 460-volt supply can be twice as large as that required on a 230-volt source—this will approximately double the secondary or welding current.

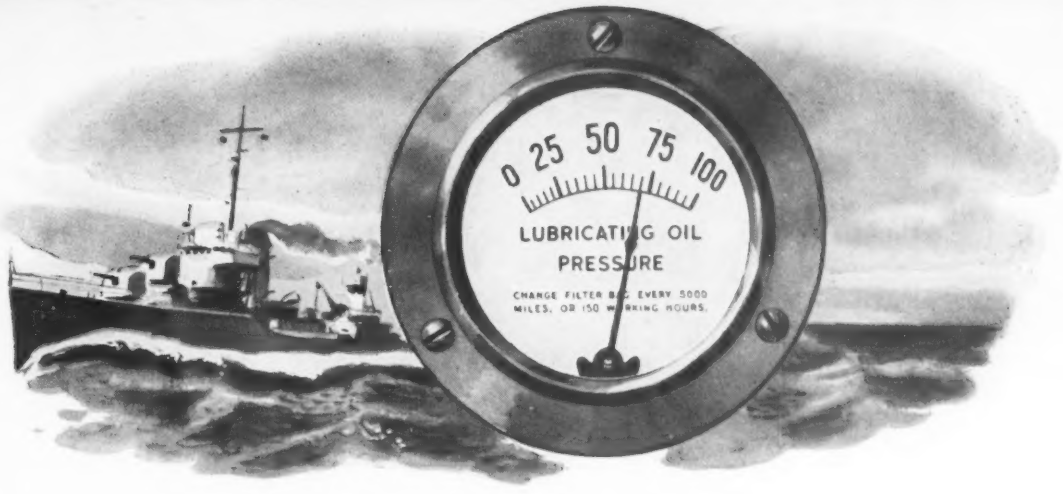
How This Control Can Help You

If you're doing small welding jobs, this control can undoubtedly help you speed up production by providing precise welding control, and thereby reducing rejects. Our local office will be glad to send you further information on the CR7503-A140A2 timer, or talk over the possibility of installing these controls on your assembly line. However, if you prefer, write directly to General Electric Co., Schenectady 5, N. Y.

GENERAL ELECTRIC

RESISTANCE-WELDING CONTROL

Buy all the BONDS you can—
and keep all you buy



Where gages must resist vibration, high temperature and corrosion

BRASS is the metal...

Deep in the engine rooms of destroyers and other Naval craft, diesel engines drive propeller shafts, generators, pumps and compressors. Service demands are severe, with all of the many indicating gages subject to high temperatures, jarring vibration and often to heavy concussion from topside salvos.

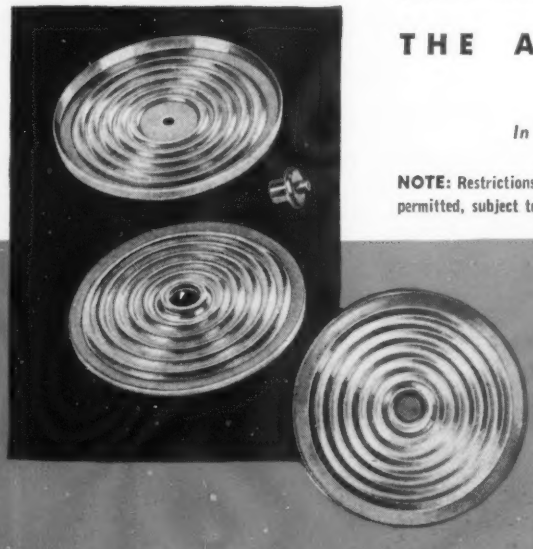
Working parts of such gages must resist corrosion and fatigue . . . must be precision-made to retain accurate calibration over long periods of rough usage. That's why Anaconda Brass was specified by "Rochester" for diaphragms and action plates—in the composition, thickness, finish, temper and extremely close tolerances necessary to meet exacting fabricating requirements.

The American Brass Company has had a great deal of experience in supplying Brass and other Copper Alloys in strip, sheet, wire, rods and tubes for gages and other precision indicating and recording instruments. Our Technical Department will welcome the opportunity to work with you in selecting materials most suitable for producing this type of equipment.

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

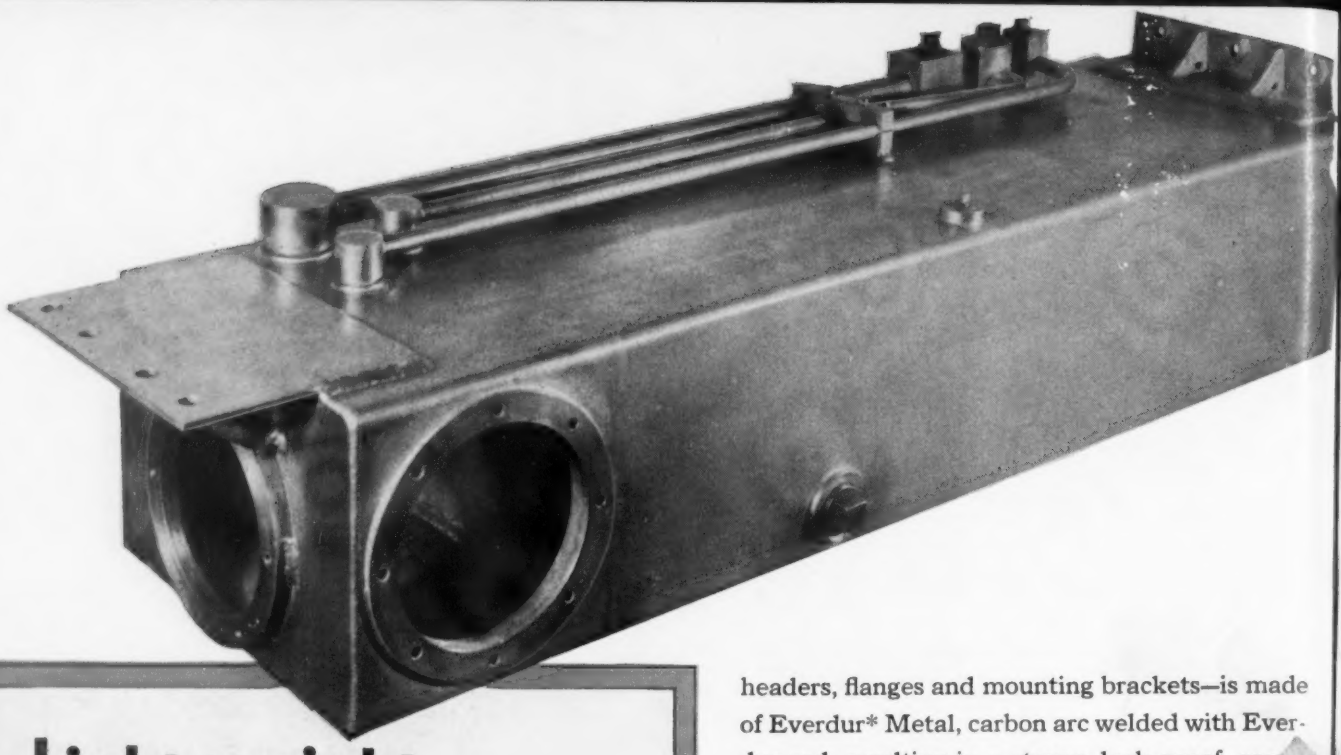
NOTE: Restrictions which have controlled our facilities and products for war purposes have been relaxed. We are now permitted, subject to any continuing requirements of the Government, to resume manufacture for many civilian uses.



Anaconda Metals are used for these important parts in Rochester Pressure and Temperature Gages. Shown at the top of this group is the stamped brass action plate with nickel silver indicating hand. At the left is the heart of the gage—the diaphragm assembly. The corrugated diaphragm is .011" brass, rolled to unusually close tolerances. The corrugated brass backplate, over which the skirt of the diaphragm is spun, is designed to cushion the diaphragm on overload pressures. The diaphragm post is machined from free cutting phosphor bronze.

ANACONDA

Anaconda Copper & Copper Alloys



Light weight, strength AND corrosion resistance *in this welded Everdur structure*

This is the main oil tank in the hydraulic control mechanism of a 5" U. S. Navy Gun. These units, 8" x 12" x 40" long, are being built by Alloy Fabricators Division of The Robinson Foundation, Inc., Perth Amboy, N. J. and operate under pressure using oil as the hydraulic medium. The entire assembly—including the body, pipe, pipe headers, flanges and mounting brackets—is made of Everdur* Metal, carbon arc welded with Everdur rod, resulting in a strong, leak-proof, corrosion resistant, lightweight assembly.

Every day new uses are being found for Everdur Metal, The American Brass Company's Copper-Silicon Alloy. And among the reasons are these: Everdur is regularly supplied in compositions suitable for either hot or cold working and is readily fusion welded with rods of similar composition by the oxy-acetylene torch or carbon arc. Furthermore, to facilitate fabrication, Everdur is produced in practically all commercial forms—sheets, strips, plates, wire, rods, bars, shafts, tubes, shells, pipe, hot pressed forgings, casting ingots, drawn shapes and special products. We'll be glad to answer your inquiries on Everdur Metal 45159

* Reg. U.S. Pat. Off.

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut
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In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

Everdur the metal of a thousand uses

PLATING ROOMS—PICKLING EQUIPMENT
Ducts, baskets, drums, drains, dryers, sludge lines, tumbling barrels, wire brushes.

RAILWAY EQUIPMENT—ROUNDHOUSES
Air conditioning and signal equipment, water tanks, electrical conduit, welding rods, train shed skylight frames.

OIL FIELDS AND REFINERIES
Chain, bolts, cable, agitator tanks, electrical conduit, sludge lines.

BRIDGES—ENGINEERING STRUCTURES
Bolts, tie rods, rivets, electrical conduit, bridge plates, framing members.

MARINE FIELD—DOCKS—SHIPYARDS
Fuel tanks, marine hardware, wood and lag screws, bolts, and other forged, cast or machined fittings.

SEWAGE PLANTS—WATER WORKS
Screens, gates, baffles, weirs, filters, frames, tanks, anchors, valve stems.

BREWERIES—DAIRIES
Kettles, vats, filters, screens, hop strainers, wort pans, process tanks and equipment.

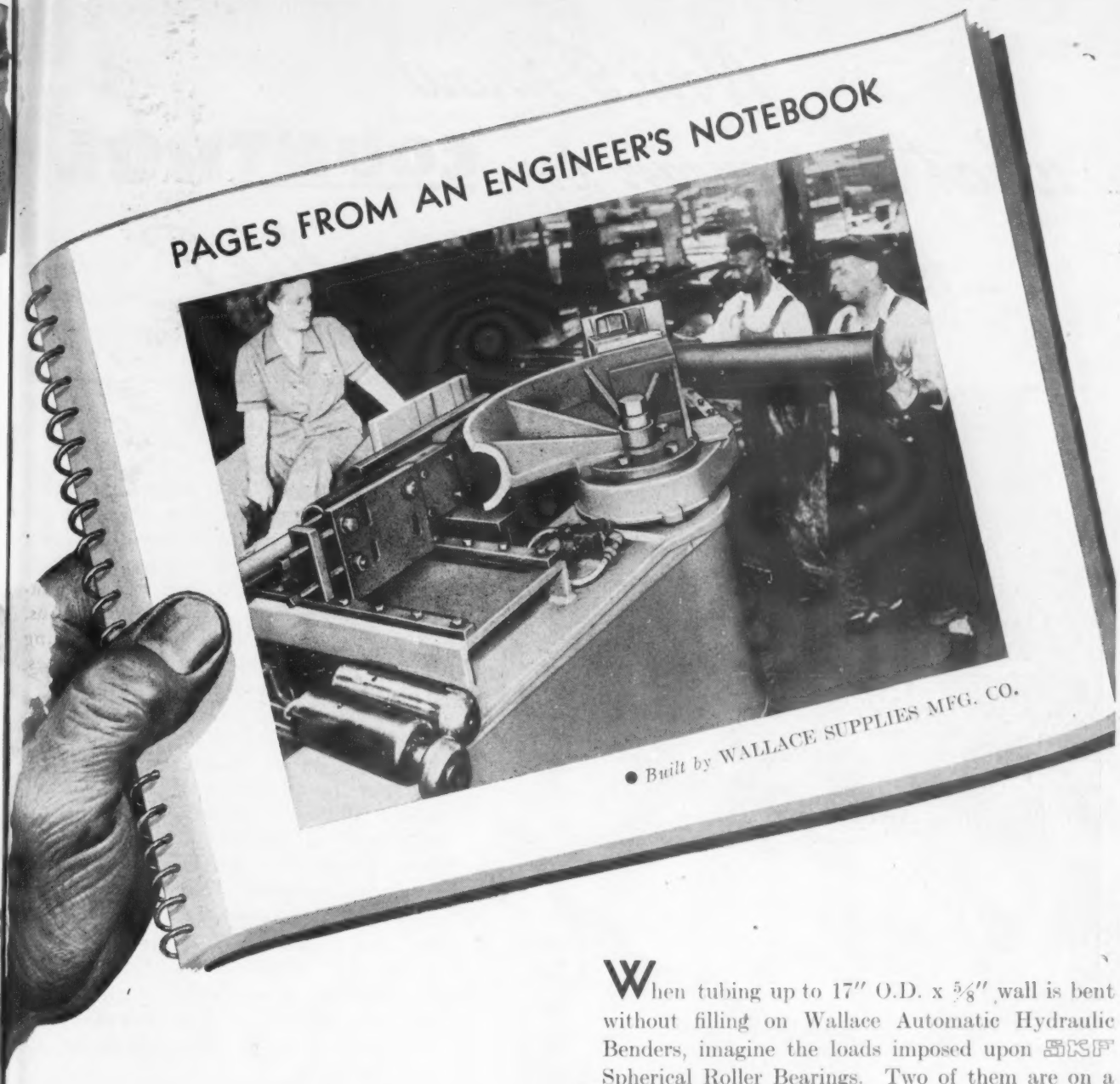
PULP AND PAPER MILLS
Carrying lines, fabricated and welded fittings, screens, doctor blades, save-all pans.

ELECTRICAL EQUIPMENT—HARDWARE
Circuit breakers, screws, bolts, nuts, washers, rivets, studs, clamps, U bolts, eye bolts, turnbuckles, etc.

CHEMICAL AND PROCESS INDUSTRIES
Pipe lines, kettles, stills, welded fittings, valves, unfired pressure vessels, pumps, storage tanks, evaporators.

ANACONDA

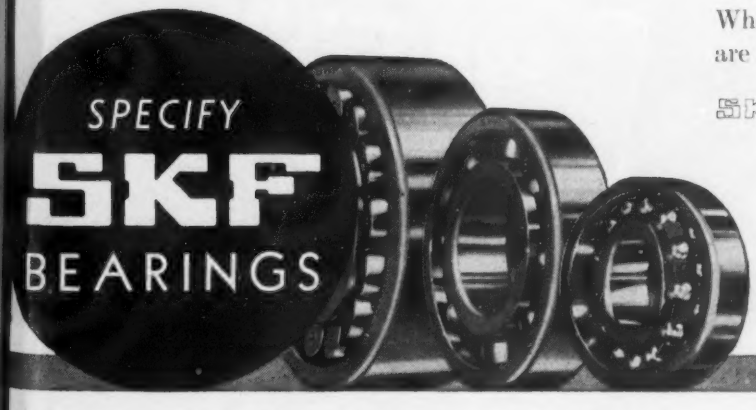
Everdur Copper-Silicon Alloy



T BENDS TUBES EASILY ON SKF BEARINGS

When tubing up to 17" O.D. x 5/8" wall is bent without filling on Wallace Automatic Hydraulic Benders, imagine the loads imposed upon SKF Spherical Roller Bearings. Two of them are on a shaft welded to the bending arm. So easy is the movement that the entire bending arm, when the chain drive is unattached, can be rotated by one man. Because they are built to compensate for shaft deflections, distortions or weave without binding, SKF's have high load carrying capacity at all times. They never need adjustments . . . run smoothly for years with only infrequent lubrication. Wherever *bearing performance* comes first, SKF's are a vital part of the job. 5796

SKF INDUSTRIES, INC., PHILA. 34, PA.



"Now I know what they mean by * COUNTROL ... where's it been all my life?"

If you want to give your workers a lift in spirits and output, give them Veeder-Root *Count*rol on their machines. It will lift from their minds the burden of guesswork and the fear of uncounted errors, shipment-delaying shortages, and wasteful over-runs. It's easy to install Veeder-Root Counting Devices to keep a running count of strokes, turns, pieces, or other performance-units of their machines. Then they can see at any time where they stand in relation to the work-schedule . . . avoid any miscounts . . . and spot any mechanical lags in their machines. Interdepartmental co-ordination will improve. The whole plant will run more smoothly. So let Veeder-Root engineers show you what a simple matter it is to install complete *Count*rol on all machines.

PS: And if you want to give your own product a lift in *marketability,* build into it a Veeder-Root Device as an extra service to your customers . . . to help them get out of your product all the performance you build into it.

VEEDER-ROOT INC., HARTFORD 2, CONN.

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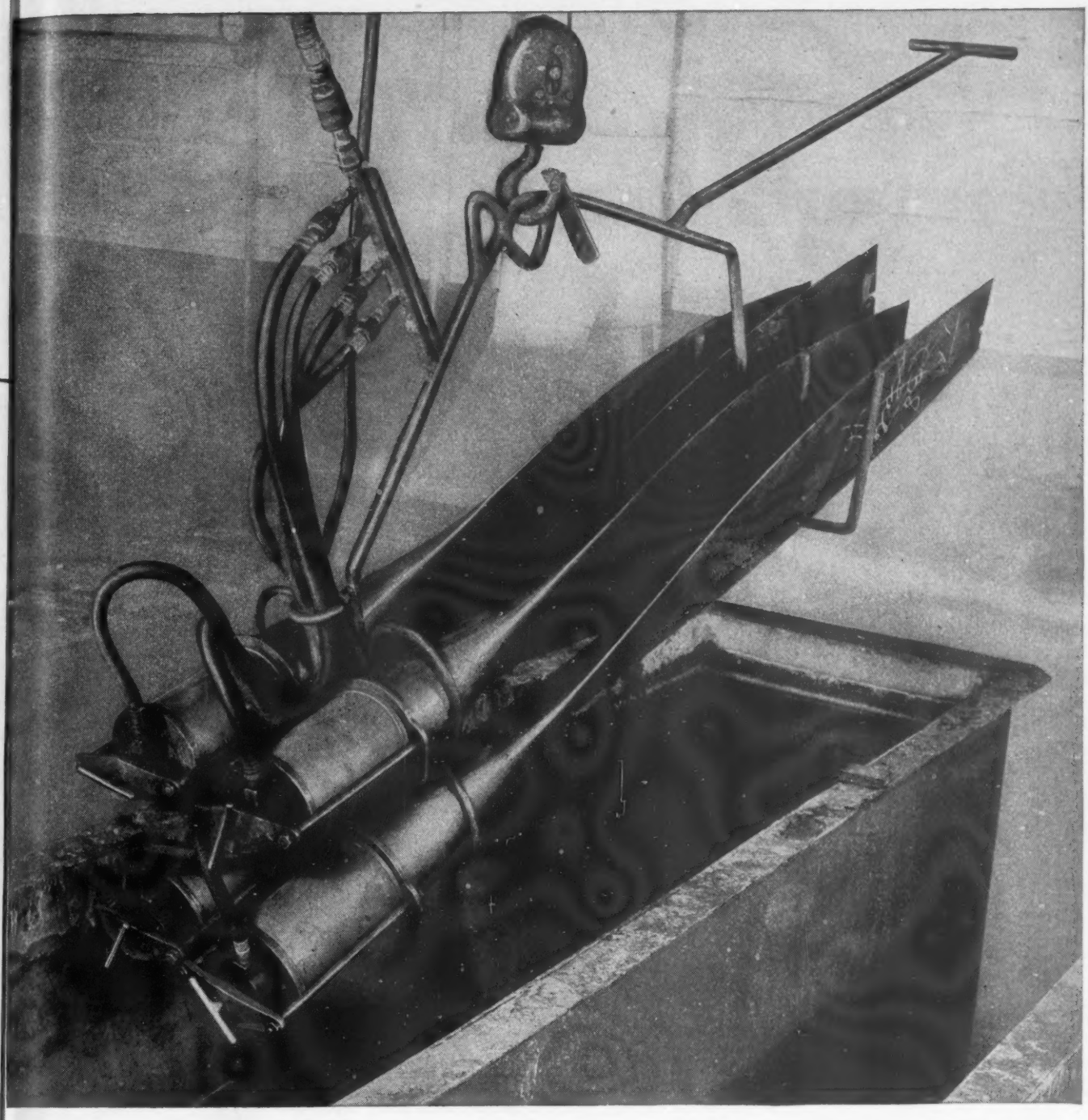
* **COUNTROL"**

means the right amount of work... completed at the right time... under the guidance of Facts-in-Figures supplied by

VEEDER-ROOT COUNTING DEVICES



Where corrosion "gets the air"

PICKLING ACID in the root cavities of steel propeller blades can't be completely neutralized or removed. Nor can it be left in the cavities, where simultaneous action of corrosion and stress will reduce the fatigue limit of the blades.

Engineers of a well-known manufacturer of propellers for Army Air Force fighter planes tried various fixtures and plugs designed to seal the blade root during the pickling operation.

Some of the solution of 15% sulfuric acid and 10% hydrochloric acid held at 180°F. always managed to find its way into the blade cavities . . . until engineers devised the unique fixture shown above.

Plugs seal the blade root. Absolute exclusion of acid from the cavities is obtained by applying dried air at −50°F. to the blade root under a pressure of 5 psi. Clamps which slip over the blade cuff ring are secured by screwing the assembly head against the blade root.

Of the various metals tested for this specially designed fixture, MONEL* was found most satisfactory. It has the necessary strength and hardness *plus* long-lasting resistance to the hot, corrosive pickling solution.

In addition, MONEL is readily shaped, formed and welded. The welds themselves are as strong and corrosion-resistant as the parent metal.

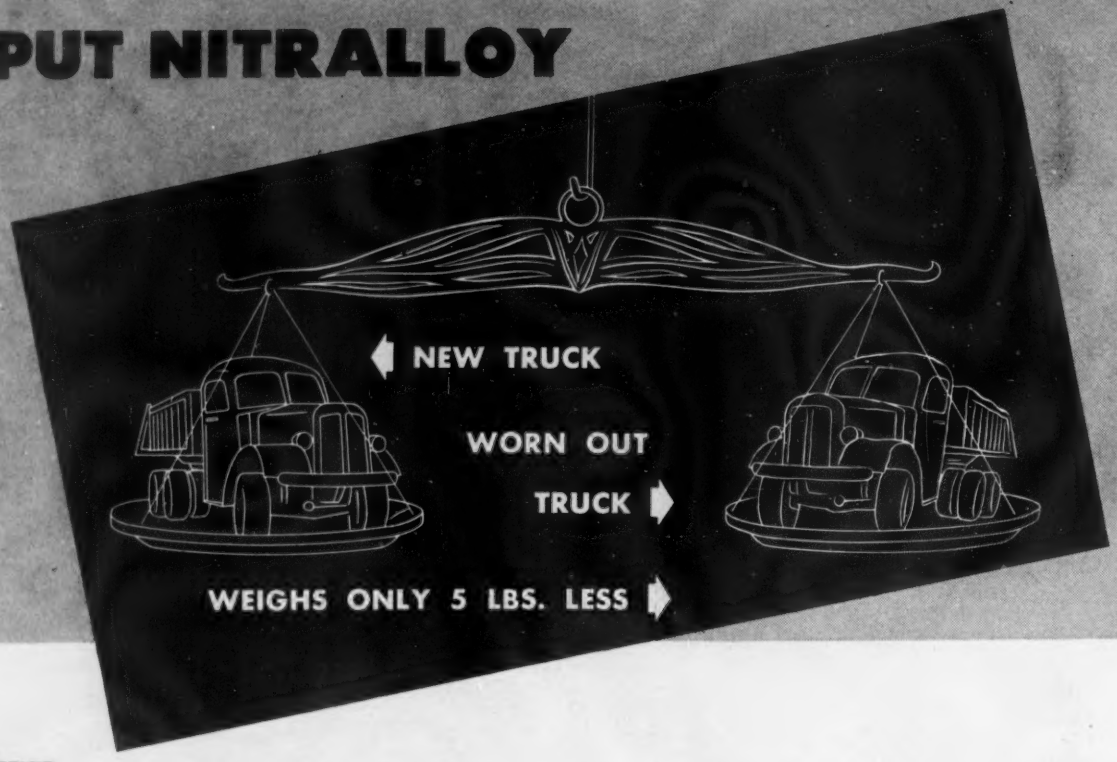
When *you* face problems in the design of pickling equipment, remember the advantages of MONEL. Remember, too, that our representatives stand ready to consult with you. No obligation involved. Simply write The International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y. for further information. *Reg. U. S. Pat. Off.

Monel

ONE OF THE INCO NICKEL ALLOYS

Where the wear is . . .

PUT NITRALLOY



WHEN a five ton truck wears out, it has lost only about five pounds of metal.

That may mean several thousand pounds to the junk yard, for the wearing away of five. It unquestionably means expensive, premature replacement part bills.

Similar startling ratios of wear-to-weight hold true with many other large machines. They indicate the value of using *Nitrided Nitralloy* for moving parts. Nitralloy wears slowly, because it is the hardest steel surface known — and one of the toughest. That's why the use of Nitralloy makes your machines longer-lived, more dependable. That's why it will pay you to write on your business letterhead for more information about Nitralloy today.

Find out how NITRIDED NITRALLOY *can extend the life and dependability of your products. Send us your specifications. Our applications engineers will study them and submit recommendations — for your use in planning Victory products. Or just ask for the informative booklet shown here. There is no obligation to you.*

7331

THE NITRALLOY CORPORATION
230 PARK AVENUE
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Allegheny Ludlum Steel Corp. ..... Watervliet, N. Y.
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FOR 101 METAL CUTTING JOBS

WELLS No. 8

Handy as a

WITH A WELLS No. 8 you can efficiently cut any size, shape or type metal you can fit into the saw. The work is simply clamped into the quick-acting vise and cutting begins. No more attention is required, for the gravity-feed and the automatic shut-off do the rest. Use your Wells for all types of cut-off work—in stores, tool rooms, maintenance. Move your portable Wells to the work and save time and labor. A simple wet cutting system is available for all Wells No. 8 models to allow coolant use on tough cutting jobs. It's a handy tool . . . this low-cost, versatile Wells No. 8. Write for details.

Specifications

CAPACITY: Rectangular	8" x 16"
(Special Guides)	5" x 24"
ROUNDS:	8" Diameter
MOTOR:	½ H. P., A. C. or D. C.
SPEEDS:	Selective 60, 90, 130 feet per minute
WEIGHT:	Approximately 750 pounds

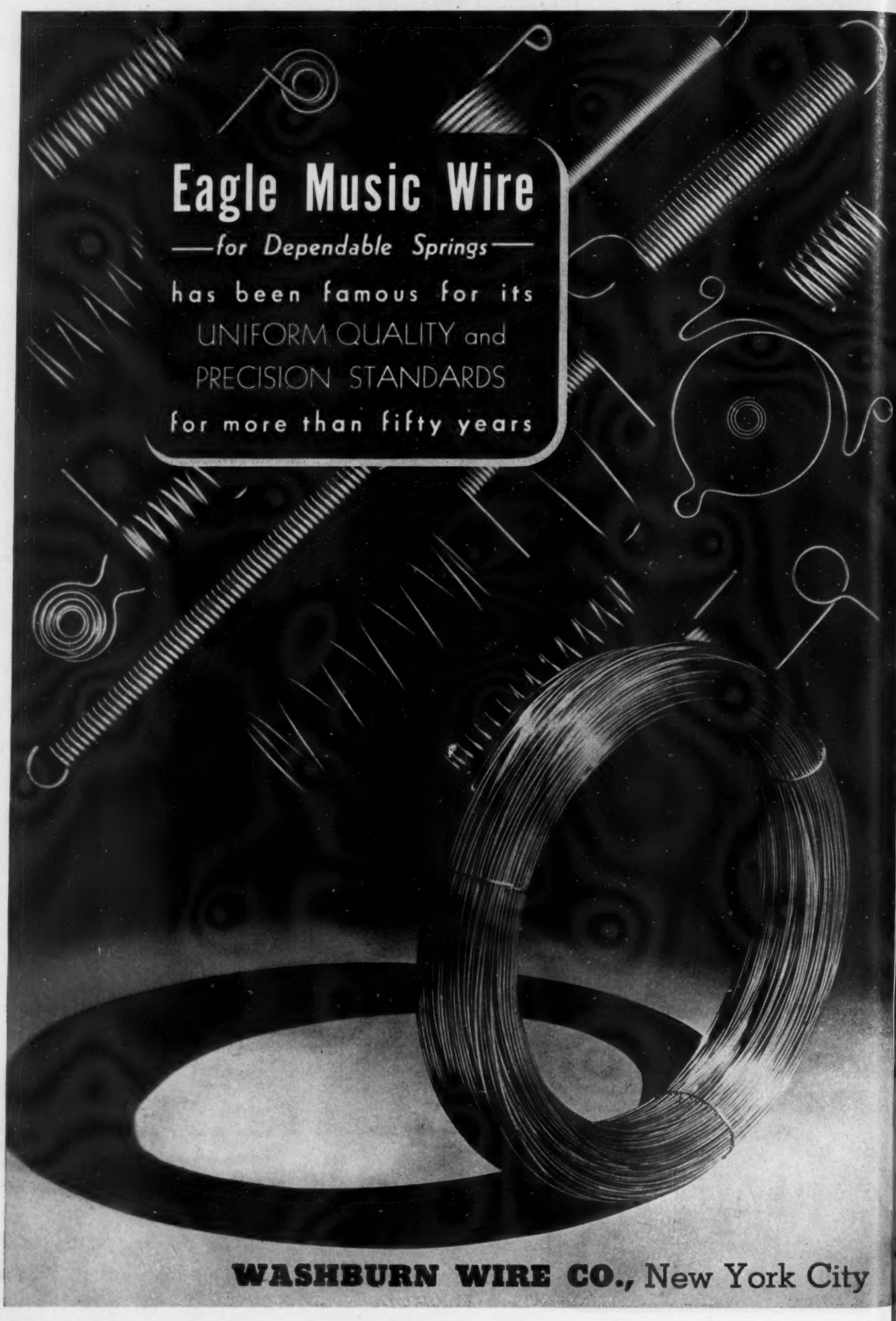
Wells saws

Wells

Products by Wells are Practical

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
1515 FILLMORE ST., THREE RIVERS, MICHIGAN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—for Dependable Springs—
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for more than fifty years
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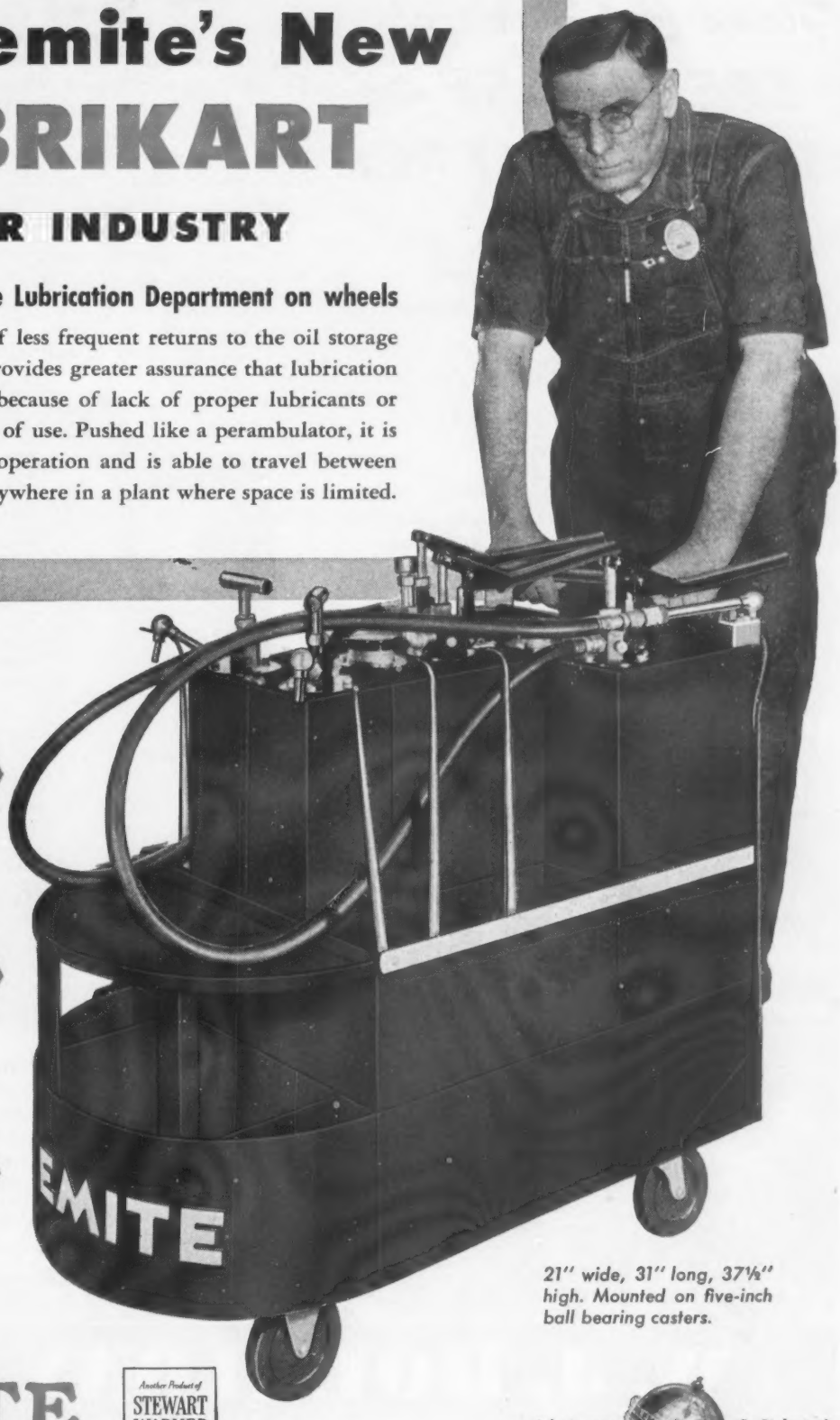
It's Alemite's New
LUBRIKART
FOR INDUSTRY

A complete, portable Lubrication Department on wheels

It saves time because of less frequent returns to the oil storage room by the oiler. It provides greater assurance that lubrication will not be neglected because of lack of proper lubricants or equipment at the point of use. Pushed like a perambulator, it is intended for one-man operation and is able to travel between rows of machines or anywhere in a plant where space is limited.



21" wide, 31" long, 37½" high. Mounted on five-inch ball bearing casters.

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FULLY EQUIPPED

ith grease pump, hose and hy-raulic coupler; hand gun loader; ar lube and oil pumps; compart-ents for oil cans; space for fittings, ols, waste etc.

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AVAILABLE FROM 12 SOURCES

Flame Cut Parts of SPEED CASE *and* SPEED TREAT *Plate*

Nationwide stocks of fast machining *Speed Case* (X1520) and *Speed Treat* (X1545) plates, plus up-to-date, well-equipped flame cutting departments, make possible the saving of time and lowering of costs on single pieces or production quantities cut from these modern steels.

Facilities for stress relieving after cutting are available when needed.

Call the nearest distributor listed below for plates in standard sizes or pieces flame cut to shape in *Speed Case*, the low carbon, open hearth, free machining steel; or *Speed Treat*, the medium carbon, open hearth, free machining steel.

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Brown-Wales Co.
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Boston 10, Mass.

Beals, McCarthy & Rogers, Inc.
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W. J. Holliday & Company
Hammond, Indiana

Earle M. Jorgensen Co.
5311 Clinton Drive
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W. J. Holliday & Company
Indianapolis, Ind.

Earle M. Jorgensen Co.
10510 So. Alameda St.
Los Angeles 54, Calif.

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Earle M. Jorgensen Co.
1657 22nd St.
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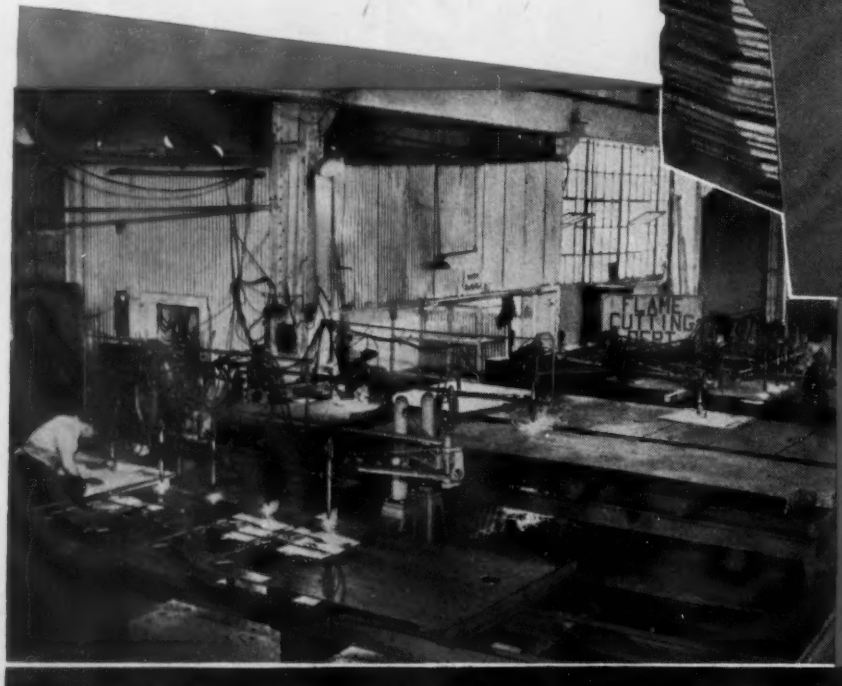
Peckover's Limited
77 Front St. E.
Toronto 2, Ont., Canada



Gas cutting installation, typical of the flame cutting departments of *Speed Case* and *Speed Treat* plate distributors.

Note:—Multiple cuts, as above, can be held to close tolerances, thus eliminating excessive machining.

W. J. HOLLIDAY & CO.

HAMMOND AND INDIANAPOLIS, IND.

***Speed Case—Speed Treat* Plate Division**

HAMMOND, INDIANA

89 Years of Progress

Established 1856

PROTECTED AGAINST ATTACK

Just as roaring guns protect our bombers against deadly enemy attacks, so a tough, durable anodic film impervious to moisture and other gases prevalent in the atmosphere protects their metal parts from corrosion.

The modern anodizing installation pictured is one located in a large eastern aircraft factory. Highly efficient G-E Copper-oxide rectifiers supply the required d-c power and dependable G-E automatic controls regulate the flow of power smoothly and steadily over the equipment's entire output voltage range.

Operation is easy and economical. To start the anodizing process the tank operator merely presses a start button. Thereafter everything is automatically controlled . . . nothing is left to chance. When the anodic film is formed, the system shuts off automatically and returns to a starting position for the next load.

The initial cost of an automatic power supply is quickly amortized through high operating efficiency and reduced power bills. To modernize and keep your anodizing or plating shop on a competitive and profitable basis equip with a new G-E automatic d-c power supply. Whether your operation is large or small, there are many G-E combinations from which to choose. The flexibility which G-E equipment offers is a plus feature that simplifies "change-over" as increased anodizing or plating capacity becomes necessary. For more information, write to Section A-852-112 Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn.

Hear the General Electric radio programs: "The G-E All Girl Orchestra" Sunday 10 P.M. EWT, NBC. "The World Today" news every weekday 6:45 P.M. EWT, CBS. "The G-E House Party" Monday through Friday 4:00 P.M. EWT, CBS.

BUY WAR BONDS AND KEEP THEM

GENERAL ELECTRIC

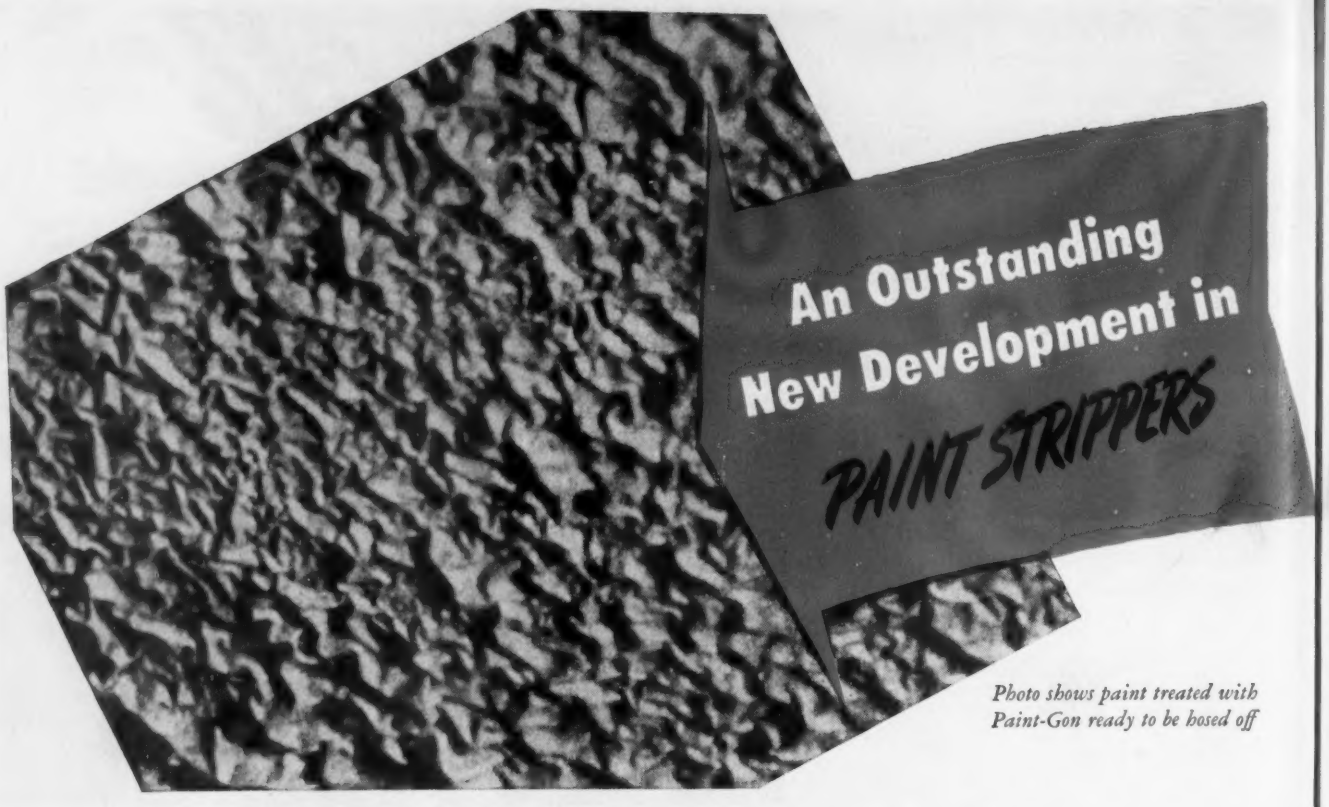


Photo shows paint treated with Paint-Gon ready to be hosed off

Turco Chemists Present Paint-Gon with 3 Outstanding Advantages

1. REGARDLESS OF THE MATERIAL UNDER THE FINISH— new Turco Paint-Gon is safe and non-corrosive to all widely used metals and wood; will not attack aluminum, magnesium, steel, cadmium, iron, zinc, or galvanizing; nor will it warp or raise the grain of wood.

2. REGARDLESS OF THE TYPE OF FINISH—new Turco Paint-Gon is effective on all kinds of coating—paint, enamel, baked enamel, varnish, lacquer, automotive synthetic enamel, baked varnish, air dry synthetic enamel, and even such stubborn finishes as baked urea alkyd and through the action of the stripper alone without scraping, scrubbing or brushing.

3. REGARDLESS OF THE CONDITION OF THE FINISH— new Turco Paint-Gon swiftly removes unwanted finishes, regardless of their condition, regardless of the number of coats, whether the finish is baked on by blistering desert sun, or cracked, or pitted.

Paint-Gon is swift in its action, removing coatings in five to twenty minutes so that it may be flushed away, leaving no gummy adhesive residue or film.

Paint-Gon may be applied by brushing, scrubbing or spraying; spreads easily and uniformly; clings well to vertical surfaces. It is non-inflammable (and does not require use of inflammable, volatile solvents), is water removable, exceptionally free-rinsing. Product itself is stable, non-separating, has no tendency to congeal, causes no trouble in shipping, storing, or handling.

Phone your nearest Turco field representative, or write Turco today. Dept. S-8.

A product of Surface Chemistry

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Surface Chemistry is the scientific balance and application of these cleaning factors to a specific problem.

WA—Wetting Action
EA—Emulsifying Action
SV—Saponifying Value
SA—Solvent Action
CA—Colloidal Activity
WC—Water Conditioning
BI—Buffer Index
PH—Energy of Alkalinity
TA—Total Alkalinity
RE—Research and Experience, the combining factor that puts all the above elements into balance and to work on your specific problem.

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INDUSTRIAL CLEANING COMPOUNDS

TURCO PRODUCTS INC. *Main Office & Factory: 6135 S. Central Ave., Los Angeles 1. Offices & Factories: 125 W. 46th St., Chicago 9; 1606 Henderson St., Houston 1, Texas. Offices and Warehouses: 415 Greenwich St., New York City 13, Atlanta, Seattle, San Francisco, Kansas City, Denver, and all principal cities*

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For Speed, Accuracy and Economy

CONSOLIDATED HEAVY DUTY MACHINE TOOLS INCLUDE....

LATHES
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MILLING MACHINES
BORING MACHINES
PLANERS
SLOTTERS
SPECIAL MACHINES
RAILROAD SHOP TOOLS

BETTS 11'-6"x11'-6" HEAVY DUTY PLANER

This machine is designed with three bed ways for even load distribution when machining especially heavy work. Variable voltage planer drive provides smooth accurate operation in a wide speed range. Soundly engineered design insures long dependable service combined with operational economy, safety and convenience.

BUILDERS OF HEAVY DUTY PLANERS SINCE 186

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CONSOLIDATED MACHINE TOOLS

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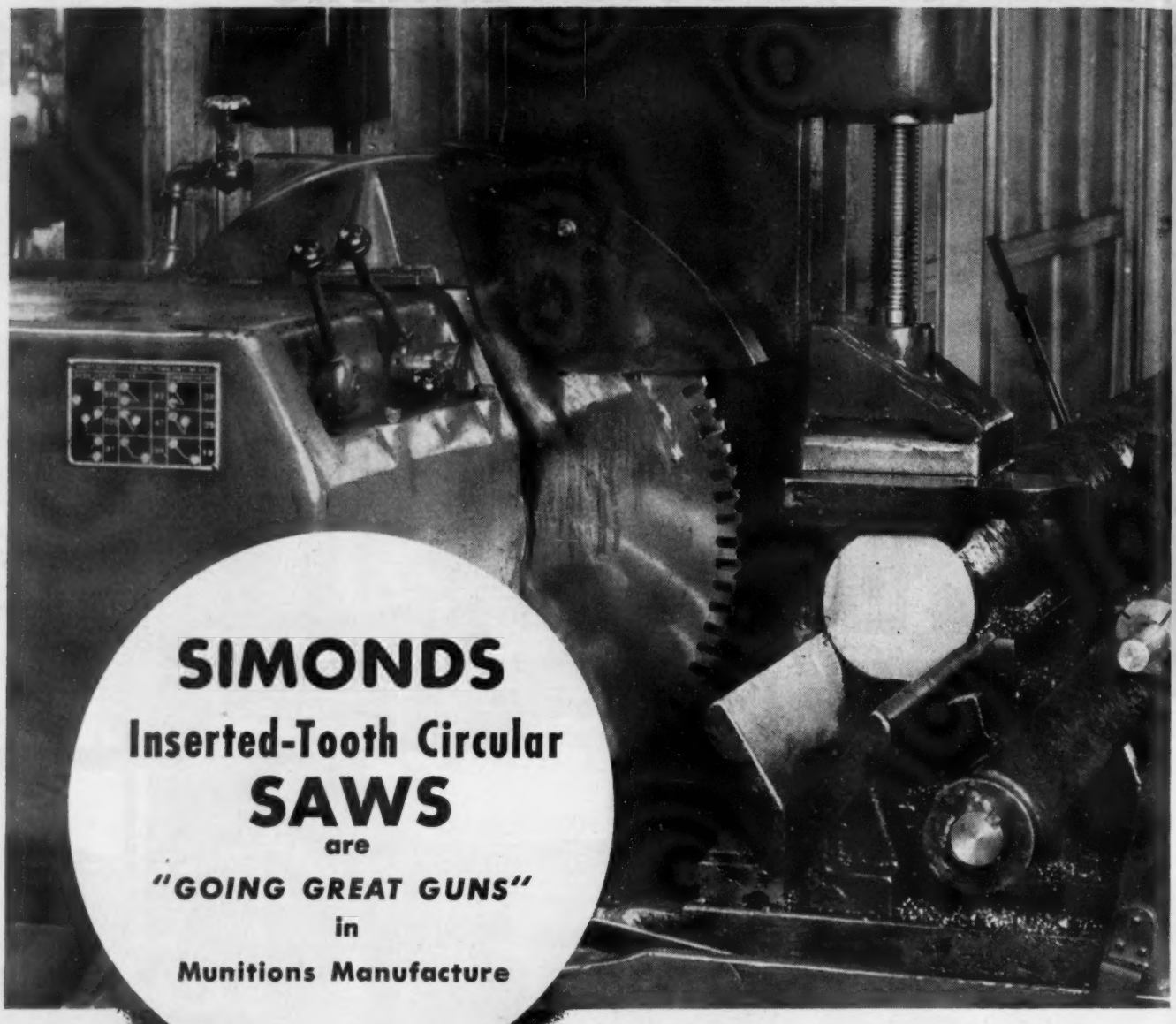
MACHINE TOOL CORPORATION

ROCHESTER 10, NEW YORK



SIMONDS

Inserted-Tooth Circular SAWS

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"GOING GREAT GUNS"

in

Munitions Manufacture

Today's Simonds Inserted-Tooth *"Red Streak"* is the most advanced development in metal-cutting saws. This Simonds design features curved gullets and high-speed steel teeth . . . with a wedge for every tooth . . . to provide greater cutting speed, feed, and depth of cut. Production is nearly double that of solid-tooth saws. And the teeth can be sharpened in the plate, or replaced when needed by a mechanic right in your own plant. Chips can't weld on. High temperatures can't dull the cutting edge.

That's why plants throughout war industry are regularly getting top saw-performance like, for instance, cutting 7-inch billets of cartridge brass in seven seconds each. *You* can get it, too, with Simonds "Red Streak" Inserted-Tooth Saws.

BRANCH OFFICES: 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Ave., Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Wash.; 416 W. 8th Los Angeles, Calif.

PRODUCTION TOOLS
FOR CUTTING METAL,
WOOD,
PAPER, PLASTICS

SIMONDS
SAW AND STEEL CO.
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CUT THE WAR SHORT... BUY WAR BONDS... AND THEN BUY MORE WAR BONDS

"With

Gulf Cut-Aid

we get more production, longer tool life and better threads"—

says this Foreman

"GULF CUT-AID proved superior to several other types of cutting fluids we tested for machining special aluminum alloy screws for aircraft," says this Foreman. "With this fine cutting oil we get greater production, longer tool life, and better threads."

This report is typical of hundreds received from shops that use Gulf Cut-Aid for machining aluminum, aluminum alloys and other nonferrous metals. For this revolutionary new cutting oil consistently shows better results in this type of work!

It will pay every machine shop to learn the full possibilities of Gulf Cut-Aid and other Gulf production-proven cutting oils. Call in a Gulf Service Engineer today and let him show you how they can help you with your machining problems. Write, wire, or phone your nearest Gulf office today.

GULF INDUSTRIAL LUBRICATION

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Please send me, without obligation, a copy of the booklet, "Gulf Cutting Oils," which includes a helpful Machining Guide.

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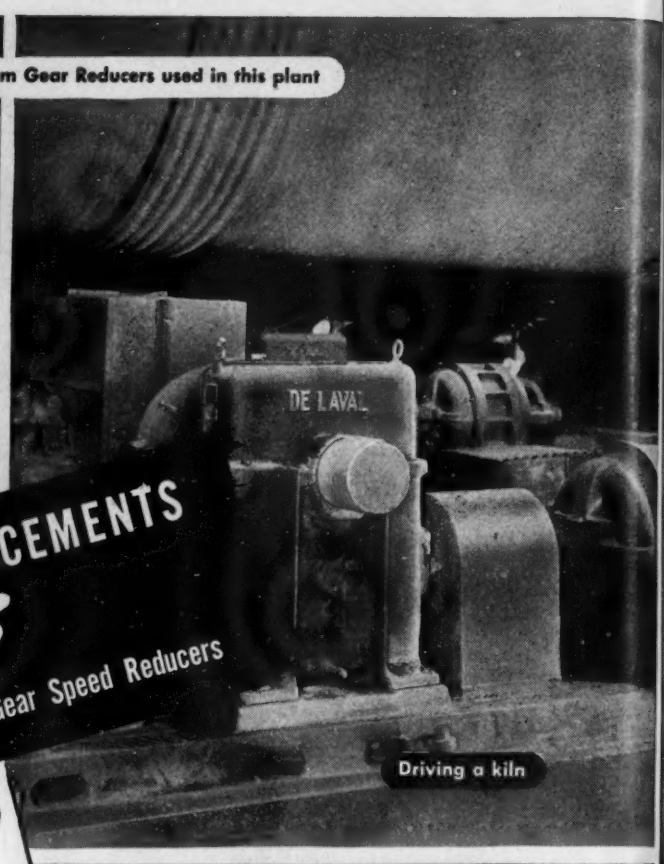
A few of the many De Laval Worm Gear Reducers used in this plant

Driving a kiln feeder



Driving a kiln

PRACTICALLY NO PARTS REPLACEMENTS in 19 YEARS

Reported by Plant Employing Many De Laval Worm Gear Speed Reducers

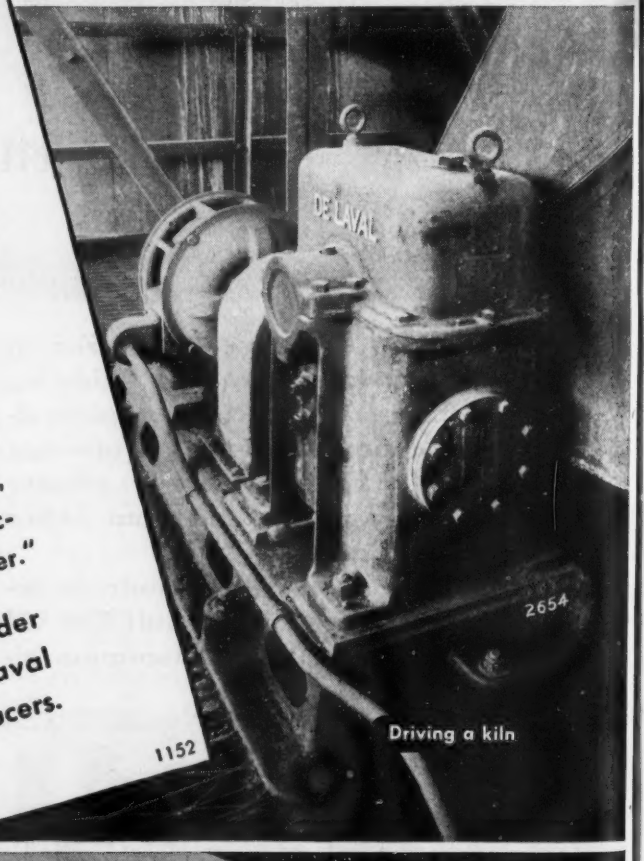
How's that for Reliability?

De Laval Worm Gear Speed Reducers have given such good service in a certain cement mill (name furnished on request) that the Plant Superintendent has written of their performance:

"There are about 175 reducers of various sizes in operation in this plant on a wide diversity of jobs; and during the last eighteen or nineteen years, since the original ones were installed, we have had to make practically no replacements of worms, wheels or bearings. In fact, there has never been any interruption in production by reason of the failure of a speed reducer."

For reliable, trouble-free service under severe conditions, specify De Laval Worm Gear Speed Reducers.

1152



Driving a kiln

TURBINES • HELICAL GEARS and WORM GEAR SPEED REDUCERS CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS and COMPRESSORS • IMO OIL PUMPS

WORM GEAR DIVISION

DE LAVAL

STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

SALES OFFICES: ATLANTA • BOSTON • CHARLOTTE • CHICAGO • CLEVELAND • DENVER DETROIT • HELENA • HONOLULU • HOUSTON KANSAS CITY • LOS ANGELES • MANILA MONTREAL • NEW HAVEN • NEW ORLEANS NEW YORK • PHILADELPHIA • PITTSBURGH ROCHESTER • ST. PAUL • SALT LAKE CITY • SAN FRANCISCO • SEATTLE • TORONTO • TULSA VANCOUVER • WASHINGTON, D.C. • WINNIPEG And Cities in Central and South America

LOOKING FOR EQUIPMENT THAT'S Tough . . . Long-lasting . . . Corrosion-resisting?

This 42-foot stainless steel tower will be used in the manufacture of commercial nitric acid. Tough, long-lasting Republic ENDURO has been widely used in this and many other types of chemical processing equipment for many years with outstanding success.

Talk to your friends who use STAINLESS STEEL

● Yes, stainless steel is the *one* all-purpose equipment material for applications involving corrosion and high temperatures—because it lasts longer in severe service.

But don't take our word alone!

Talk to your business acquaintances who already are using stainless steel equipment. Let them tell you about the profitable, money-saving advantages of using stainless steel for trays, tanks, vats, pressure vessels, valves and other chemical processing applications.

Ask them about the various ways in which stainless steel cuts maintenance and replacement costs . . . about the tough, hard surface which provides lifelong protection against rust, corrosion, rough use and abuse.

See if they don't agree that stainless steel resists the action of most acids and alkalies—hot or cold . . . resists scaling at high temperatures . . . and retains its high strength at elevated or sub-zero temperatures.

Above all, remember this: *There is no finer stainless steel than Republic ENDURO*—made by the world's foremost producer of alloy and stainless steels.

Plan now to install ENDURO equipment. For complete details, see your equipment manufacturer or write directly to:

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, N. Y.

Republic

ENDURO STAINLESS STEEL

Reg. U. S. Pat. Off.

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

THE TRANSITION WILL BE EASY

AT NATIONAL FORGE

WAR PRODUCTS

PERISCOPE TUBES
GUN BARRELS
GUN PARTS
BREECH BLOCKS
BREECH HOUSINGS
NAVAL SHAFTS
AIRCRAFT FORGINGS
TURBINE ROTORS
DIESEL CRANKSHAFTS
CONNECTING RODS
COMPRESSOR SHAFTS
COMPRESSOR CYLINDERS
MACHINERY FORGINGS
PIPE MOLDS
BORING BARS
INGOTS

PEACE PRODUCTS

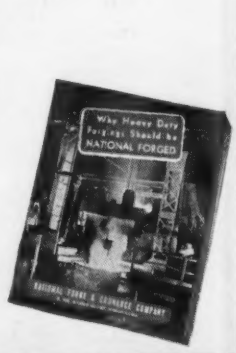
DIESEL CRANKSHAFTS
CONNECTING RODS
COMPRESSOR SHAFTS
COMPRESSOR CYLINDERS
MACHINERY FORGINGS
PIPE MOLDS
BORING BARS
TURBINE ROTORS
COLUMNS
LATHE SPINDLES
ECCENTRIC SHAFTS
NON-MAGNETIC FORGINGS
PISTON RODS
RAM FORGINGS
TIE RODS
TRUNNIONS
RINGS
SHAFTS
INGOTS
—and many other forgings

Note that many products made for war are the same as products made for peace.

ARMY E NAVY

Now that the pattern of peace begins to take form, so does the pattern of peacetime production. And heavy duty steel forgings will have a basic place in that pattern—to an even greater extent than in the prewar period. So it's not too early to know who will be your forging makers, even if the design of those forgings is not yet on paper.

This, then, is the time to know National Forge. Not just because it has been making forgings for thirty years. Or because its facilities naturally have been greatly expanded during the war years. Or because it has five White Star Citations for excellence in wartime production—earned with the same men and machines that will be available for peacetime work. But very much because of the experience, the "know how" and the proved procedures it can place at your command in planning the forgings of tomorrow—today. Let this new book tell you why.



NATIONAL FORGE & ORDNANCE CO.
IRVINE, WARREN COUNTY, PENNSYLVANIA
"WE MAKE OUR OWN STEEL"

IF YOU HAVEN'T GONE THROUGH THE PLANT, BE SURE YOU GO THROUGH THIS BOOK—WRITE FOR YOUR COPY

2 Reasons why

RED LEAD

means Extra Rust Protection . . .

Why is Red Lead so widely accepted throughout industry as *The* metal protective paint?

Why are paints containing Red Lead so generally specified for safeguarding metal surfaces from the costly ravages of rust?

The reasons are many, but none are more noteworthy than Red Lead's ability to counteract acid conditions and to halt electrochemical action—both prime causes of rusting—as explained at right.

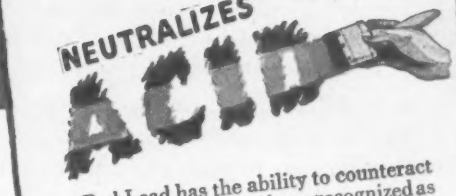
Still another important advantage of Red Lead is that it partially combines with the usual vehicles to form compounds generally known as "lead soaps." Due to their composition and the individual way in which these compounds form, the film obtained is highly water-resistant. In addition, lead soaps contribute to the formation of tough, elastic films that "stick on the job."

Remember, too, that Red Lead is compatible with practically all vehicles commonly used in metal protective paints, including phenolic and alkyd resin types.

Specify Red Lead for ALL Metal Paints

The value of Red Lead as a rust preventive is most fully realized in a metal paint where it is the only pigment used. However its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better metal paint if it contains Red Lead.

2 Another outstanding reason Red Lead means *extra* rust protection is the unique way it shields metal surfaces with a protective film. Rusting is fundamentally an electrochemical process in which weak currents are generated which cause iron to become soluble in the lowest state of oxidation. Red Lead has properties through which this iron is rapidly converted to a stable compound that forms an adherent film. The formation of this protective shield halts electrochemical action, thus preventing further corrosion.



1 Red Lead has the ability to counteract acid conditions which are recognized as accelerators of rust. Structural steel is exposed to such environments because acid forming compounds are carried by the atmosphere in the form of gas, smoke and moisture. Red Lead has a neutralizing effect on these conditions as it is essentially a *basic* pigment with the ability to develop and maintain, for a prolonged time, a mild alkaline environment at the surface of the metal. Authoritative tests show that, as a result, Red Lead inhibits the process of corrosion. In short, metal paints, too, should "stay on the alkaline side."

Write for New Booklet

"*Red Lead in Corrosion Resistant Paints*" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior metal protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

* * *

The benefit of our extensive experience with metal paints for both underwater and atmospheric use is available through our technical staff.

NATIONAL LEAD COMPANY: New York 6, Buffalo 3, Chicago 10, Cincinnati 3, Cleveland 13, St. Louis 1, San Francisco 10, Boston 6 (National-Boston Lead Co.); Pittsburgh 30 (National Lead & Oil Co. of Penna.); Philadelphia 7 (John T. Lewis & Bros. Co.)

DUTCH BOY
RED LEAD

Knock-Out
UNIVERSAL TOOL GRINDERS
ARE READY...

MULTIPLE SPEED
UNIVERSAL TOOL GRINDER

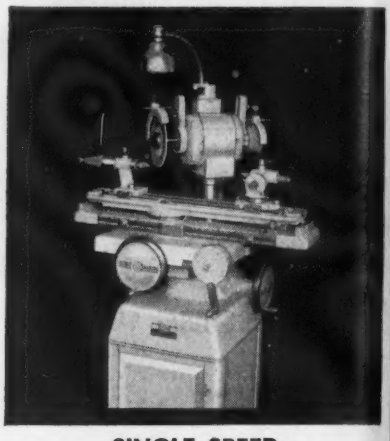
For postwar production and maintenance too . . .

Ready! Yes, ready to serve on the tremendous job which is still ahead. When the war began *Knock-Out* Tool Grinders were ready and served their country and Allied Nations well. Now, as reconversion becomes a reality *Knock-Out* Grinders are once again ready to take their place on the production line and on tool maintenance work.

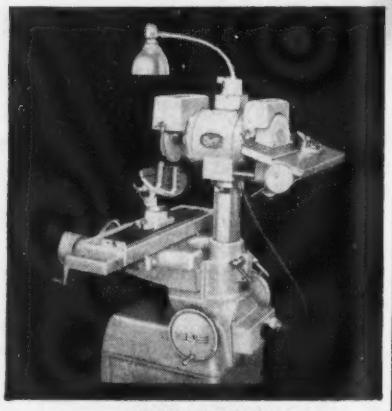
A product is no better than the tools with which it is cut and shaped. Keep those tools sharp and keep them right! Whether you're using high speed steel or carbide tipped cutting tools, there is a K-O Grinder built to accommodate your needs. The low original cost and negligible upkeep on *Knock-Out* Grinders makes hiring others to do cutting tool maintenance highly impractical.

Knock-Out Engineers have made available more time-tested grinder fixtures than has any other manufacturer. If it can be done—it can be done more easily and economically on a K-O Grinder.

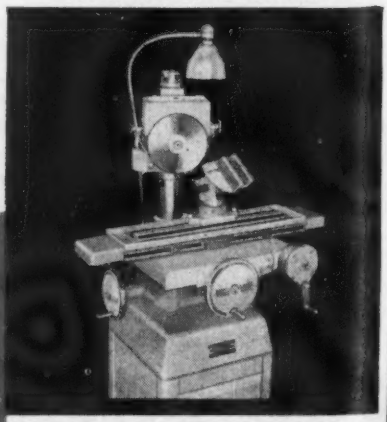
Get in touch with *Knock-Out* at Aberdeen or with your nearest K-O distributor.



SINGLE SPEED
UNIVERSAL TOOL GRINDER



UNIVERSAL
CARBIDE TOOL GRINDER



CHIP BREAKER GRINDER

See Your Nearest Distributor Or Write To

K. O. LEE COMPANY--ABERDEEN, S. D.

Manufacturers of fine tools and equipment for over thirty years

The competition for postwar markets is going to call for some close attention to manufacturing costs. They *must* be kept down . . . and without sacrifice of product performance.

That's your cue to investigate ArmaSteel.

ArmaSteel is a high-strength, highly machinable metal that is cast to conform closely to finished shapes. The reduction in the amount of metal to be removed saves time and money. Exceptional machining characteristics extend tool life and permit increased production per man-hour. A wide range of physical properties, consistently obtainable through production heat-treating processes, makes sure that your ArmaSteel part will meet the particular requirements of your application.

You can eliminate many operations, and speed the rest, by designing parts in ArmaSteel. Get the facts today...for a better product at less cost tomorrow.

KEEP BUYING WAR BONDS

ArmaSteel*

CAST FOR A LEADING ROLE IN INDUSTRY

SAGINAW MALLEABLE IRON DIVISION OF GENERAL MOTORS

SAGINAW, MICHIGAN

*Reg. U.S. Pat. Off.

MOST SHORT CENTER DRIVES SLIP TOO MUCH ...NOT THIS F. L. A. T. DRIVE

ESPECIALLY WHEN BELTED BY "RESEARCH"

Belt slip . . . which wastes power and burns belts . . . is caused by insufficient belt tension or insufficient belt grip. Neither of these faults can exist on a Flat Leather Automatic Tension drive equipped with "Research" leather belt.

The pivoted base of the F.L.A.T. drive automatically adjusts belt tension to accommodate varying loads. And the high-friction, pliable "Research" belt hugs the small pulleys with maximum pulley grip.

Careful checking of hundreds of cases where "Research" has been used with the F.L.A.T. drive, has proved more power delivery at rated load than a comparable V-belt drive; and this efficiency is maintained under conditions (above or below rated load and rated tension) where efficiency of other types of belting drops way down.

The life of a "Research" leather belt on F.L.A.T. drive exceeds that of a V-belt on a comparable drive, which is further proof that slippage is much less on this type of drive.

Ask your Graton & Knight distributor for a demonstration.

"Research" Leather Belting is the belt recommended for dependable, trouble-free service on Flat Leather Automatic Tension drive.

An exclusive "weight-controlled" currying, which works back into the leather the proper amount of life-giving, life-preserving natural lubricants, is responsible for the high coefficient of friction and extreme pliability. "Research" hugs the small pulley with minimum slip and takes the continual flexing without excessive wear or waste of power. Its load-carrying capacity actually *improves* with use.

Write for new, free Belting Manual — to Graton & Knight Company, 322 Franklin Street, Worcester 4, Mass.

GRATON AND KNIGHT

Research Leather Belting

from Graton & Knight's line of leather belting—the most complete for all applications. Graton & Knight distributors are listed under "Graton & Knight" in "Belting" section of Classified Telephone Directory and THOMAS' REGISTER.

IT'S NEW!

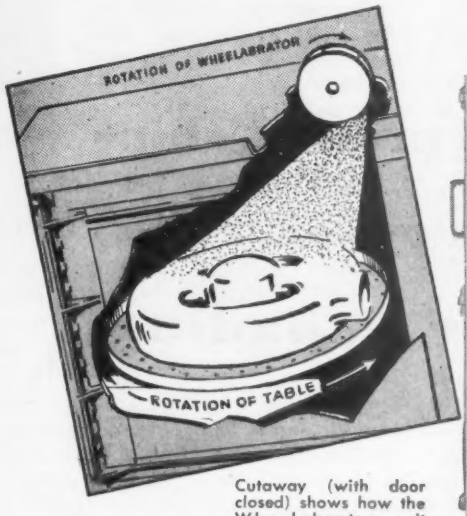
THE WHEELABRATOR Swing Table

Another in a long list of important blast cleaning developments pioneered by American is the NEW Wheelabrator Swing Table shown below.

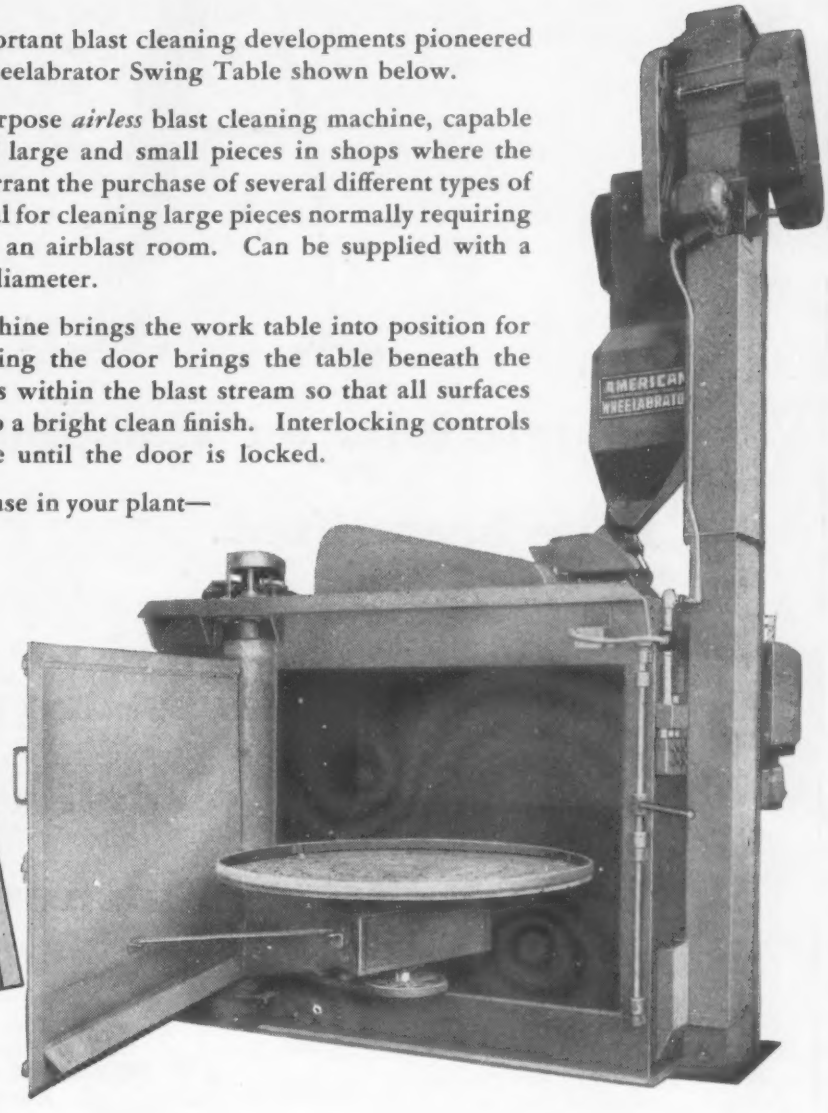
This is a versatile general purpose *airless* blast cleaning machine, capable of handling a wide range of large and small pieces in shops where the daily production does not warrant the purchase of several different types of cleaning equipment. It is ideal for cleaning large pieces normally requiring a laborious hand blasting in an airblast room. Can be supplied with a table 24", 66", 72" or 86" diameter.

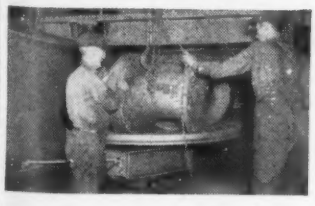
Opening the door of the machine brings the work table into position for loading or unloading. Closing the door brings the table beneath the Wheelabrator where it rotates within the blast stream so that all surfaces and cored areas are scoured to a bright clean finish. Interlocking controls prevent discharge of abrasive until the door is locked.

Put this machine to profitable use in your plant—
write for full details today.



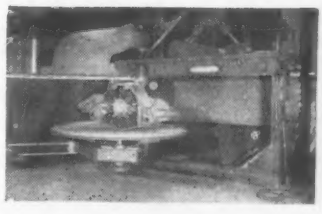
Cutaway (with door closed) shows how the Wheelabrator unit pours a continuous stream of abrasive upon the work to the full width of the table.





A 66" Wheelabrator Swing Table used by Ottumwa Iron Works, Ottumwa, Iowa, has cut cleaning costs 25 per cent and reduced cleaning time to 8 minutes per table load, in cleaning steam drum winches, electric hoist castings and miscellaneous gray iron castings.

The 86" Wheelabrator Swing Table at the Link Belt Ordnance Co., Chicago, cleans large parts for anti-aircraft and howitzer gun carriages in about one-fifth the time formerly required for hand blasting in a large airblast room.



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FOUNDRY EQUIPMENT CO.

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All Government restrictions on Vanadium shipments have been lifted.

★

Adequate stocks assure prompt shipment and quick delivery of Ferro Vanadium and other Vanadium products.

MAKERS OF VANCORAM BRAND FERRO ALLOYS AND METALS

VANADIUM CORPORATION OF AMERICA

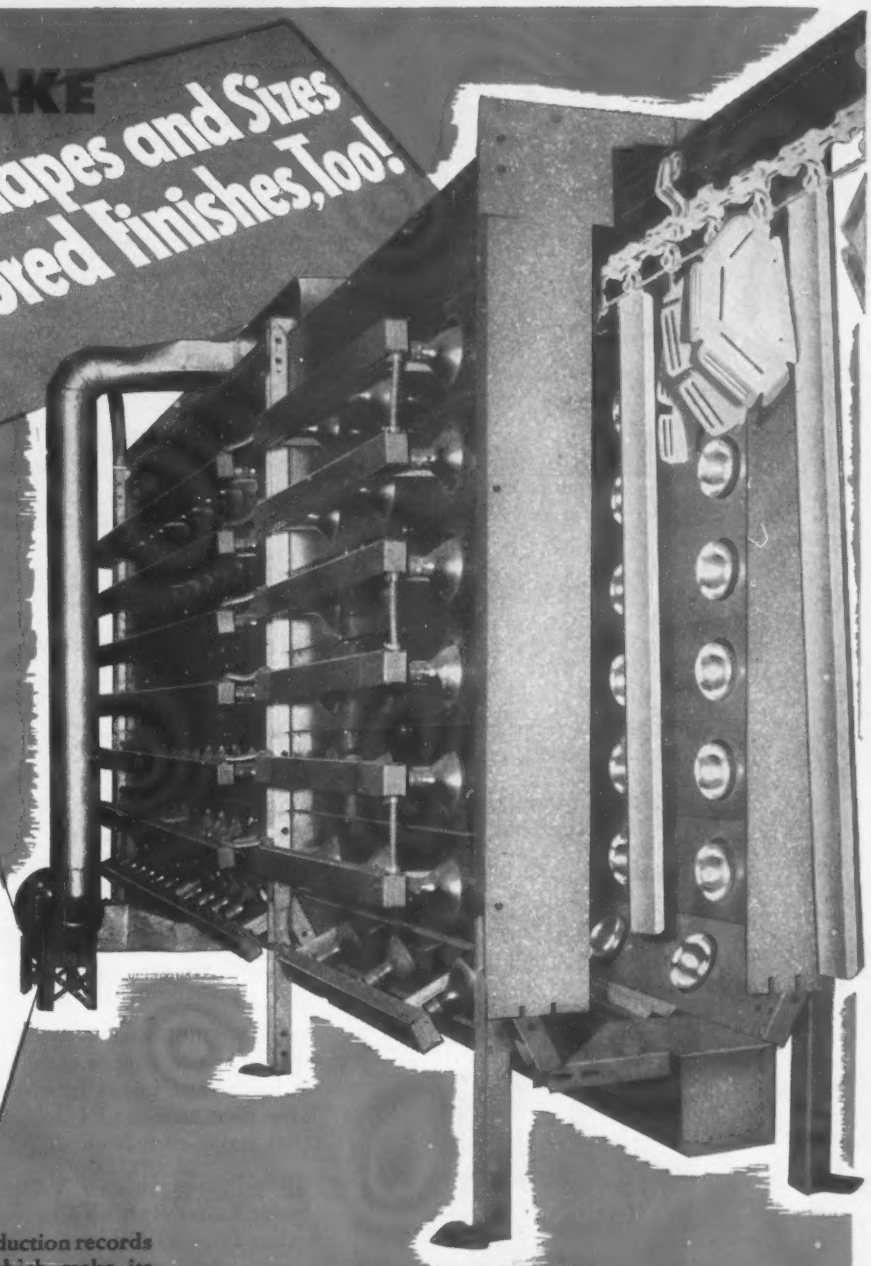
420 LEXINGTON AVENUE • NEW YORK 17, N. Y.

DETROIT • CHICAGO • CLEVELAND • PITTSBURGH

YOU CAN BAKE Different Shapes and Sizes Light Colored Finishes, Too!

FASTER BETTER in a C. M. HALL Radiair INFRA-RED OVEN

RADIAIR OVENS always have incorporated the *time-saving* benefits of instant infra-red heat and the *extra-use* value of recirculated, derived heated air . . . engineered to *produce greater overall heating efficiency on every application.*



This 14 ft., 45-kilowatt RADIAIR oven was installed for Metal Crafts Co., Philadelphia. Operates on 10-minute baking cycle. Produces 75 pieces per hour.

INFRA-RED RADIANT HEAT is establishing new production records for industry today! Yet, it has limitations which make its extended use impractical, unless correctly engineered for maximum benefits.

Baking of odd sizes and irregular shapes is considered a tough problem for infra-red. Baking light-colored or transparent finishes is also difficult, because such finishes reflect a certain percentage of infra-red energy. Hall solves both of these problems with the *RADIAIR* principle: the engineered combination of infra-red radiant heat and the *controlled* movement of derived, convected heated air. Recirculated heat reaches and thoroughly bakes surfaces shielded from infra-red rays—speeds the efficient heating of light-colored finishes.

In the Hall infra-red oven shown above, a white enamel finish is now baked on fluorescent lighting fixtures and reflectors of different sizes and shapes with faster, better results. It was built at surprisingly low cost. It occupies little space. It has greatly increased production. It has created substantial over-all economies.

Learn how C. M. Hall *economy-engineering* can fit infra-red heating right into your production line . . . supplementing, complementing, or replacing your present heating equipment.

SEND FOR "*INFRA-RED AT WORK.*" Get *all* the facts in this 28-page booklet. **WRITE TODAY.**

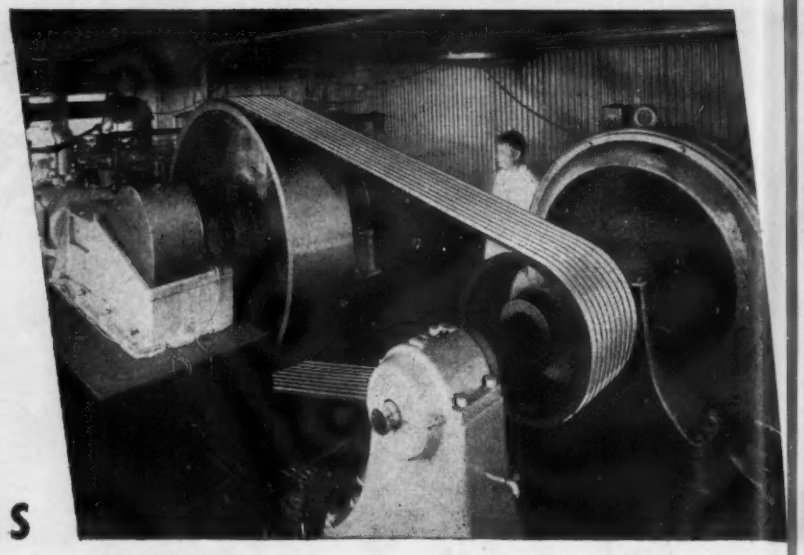
C. M. HALL LAMP CO. — HEATING FOR BAKING INSTANT CONTROLLED HEAT DEHYDRATING

C·M·HALL Lamp Company

PIONEER DESIGNERS AND BUILDERS OF INFRA-RED RADIANT HEATING EQUIPMENT

1005 EAST HANCOCK ST. ***Representatives in Principal Cities*** **DETROIT 7, MICHIGAN**

Right now!



Your Standard
GATES VULCO ROPES

are the BEST V-BELTS Gates Ever Delivered to You!

That is a strong statement but it is simply a *fact*—
and here are the reasons for it.

To meet the needs of our Army's tanks, tractors and self-propelled big guns in *combat service,* it was necessary to develop V-Belts far superior to any that had ever been built before. Gates developed and built these greatly superior V-BELTS—and here is why this fact is important to you:--

- **Every improvement developed by Gates for these Army V-BELTS has been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.**

You have not had to wait until after the war for these improvements for the simple reason that more efficient V-Belts have been an important factor in increasing essential war production. That is why your standard Gates Vulco Ropes are today the best V-Belts that have ever been delivered to you.

In addition, where V-Belts of special construction are required, your Gates Rubber Engineer is in position to supply a Gates V-Belt that is precisely engineered to meet your special needs. You need only pick up your phone book and look under the heading "Gates Rubber." The Gates Rubber Engineer will bring to you, right in your own plant, the very latest advances in V-Belt construction and in drive operation as well.

IN ADDITION--

Gates also makes these special belts to meet exceptional service needs.

- Rayon Cord V-Belts
- Static-Safety V-Belts
- *Special* Synthetic V-Belts
- Cotton Cord V-Belts
- Steel Cable V-Belts

All Gates V-Belts are Built With *The Patented* **CONCAVE SIDE**

Gates — THE MARK OF SPECIALIZED RESEARCH

THE GATES RUBBER COMPANY

Engineering Offices and Jobber Stocks in All Large Industrial Centers

458

GATES VULCO ROPE DRIVES

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LOS ANGELES 21, CAL., 2240 E. Washington Blvd. DENVER 17, COLO., 999 S. Broadway DETROIT 4, MICH., 8663 Grand River Ave.
PORTLAND 9, ORE., 333 N.W. 5th Ave. DALLAS 2, TEXAS, 1710 N. Market St. SAN FRANCISCO 3, CAL. 1090 Bryant St.

MEMO..... from the desk of the Exec. Vice President
Att. Advertising Department
VINCO TAPER RINGS & MASTER PLUGS
Accurate to a tenth - superior finish by exclusive VINCO methods - - designed to check one of the most exacting of precision parts - the control bushing on airplane propellers - one VINCO item, but it typifies the care, skill and overall perfection that is the mark of all VINCO Precision Products - a powerful suggestion that to buy VINCO is to buy with the confidence that the Standard of VINCO Excellence will always be an unfailing standard when future gaging needs are to be met.

MILLIONTHS OF AN INCH FOR SALE BY VINCO

REG. U. S. PAT. OFF.

VINCO CORPORATION, 8863 SCHAEFER HIGHWAY, DETROIT 27, MICHIGAN; SALES OFFICES, NEW YORK, CHICAGO, CLEVELAND

Semi-Automatic Hydraulic Spline and Gear Grinder • Optical Master Inspection Dividing Head • Involute Checker • Angle Tangent to Radius Dresser • Index Plates • Precision Vises • Sine Bars • Straight-side Spline, Serration Spline, Involute Spline and Helical Spline Plug and Ring Gages • Thread Plugs, Rings and Setting Plug Gages • Spur and Helical Master Gears • Munition Gages • Propeller Hub Gages • Built-up and Special Gages • Gear Rolling Fixtures • Spline and Index Fixtures • Hydraulic Power, Control, Utilization and Distribution Units • Engineering, Design and Development.

WOULD A

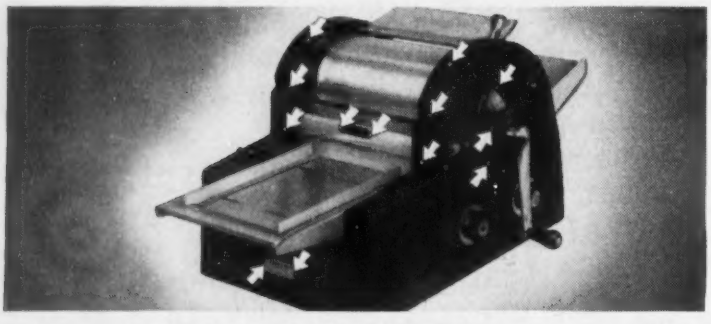
50% Assembly Saving

HELP YOUR PRODUCT BEAT POSTWAR COMPETITION?

CUTTING ASSEMBLY COSTS IN HALF is nothing unusual for P-K Self-tapping Screws *the short cut fastening method!* Records of thousands of applications show frequent savings of 30 to 50%.

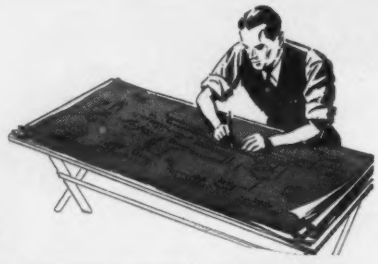
THERE'S NOTHING EXCEPTIONAL about such savings, either. In 7 out of every 10 jobs submitted for fastening survey, it was found that P-K Screws could eliminate tapping – speed assembly – lower costs – reduce spoilage – improve strength and rigidity.

WHY HANDICAP YOUR PRODUCT in the postwar market with needlessly high assembly costs? Change over now to the short cut fastening method – *before* production starts!

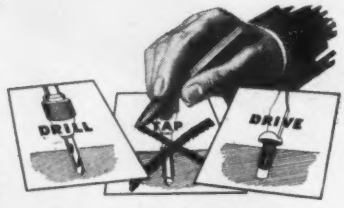


FASTENINGS TO HEAVY AND LIGHT STEEL, ZINC, ALUMINUM . . . WITH SAVINGS UP TO 40% of time and labor . . . stronger assemblies . . . faster production. That is what Ditto, Inc., gained by using P-K Type "Z" and Type "U" Self-tapping screws for 52 fastenings on this duplicating machine. Now, their policy is "to use this short cut method wherever possible" . . . good advice for you!

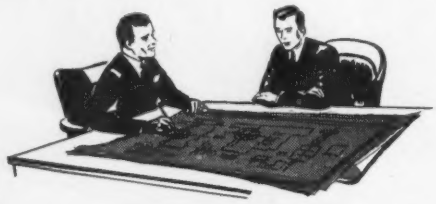
HERE'S HOW TO START ASSEMBLY SAVINGS WHEN YOU START PRODUCTION



1. **QUESTION EVERY FASTENING** in your plans. Ask – "Can it be done the simpler way – with P-K Self-tapping Screws?" – before you O.K. more complicated methods.



2. **WITH THE "USERS' GUIDE"** (free to assembly planners on request), find out how and where you can use P-K Self-tapping Screws to eliminate tapping, costly inserts in plastics, awkward bolting and other "slowdown" methods.

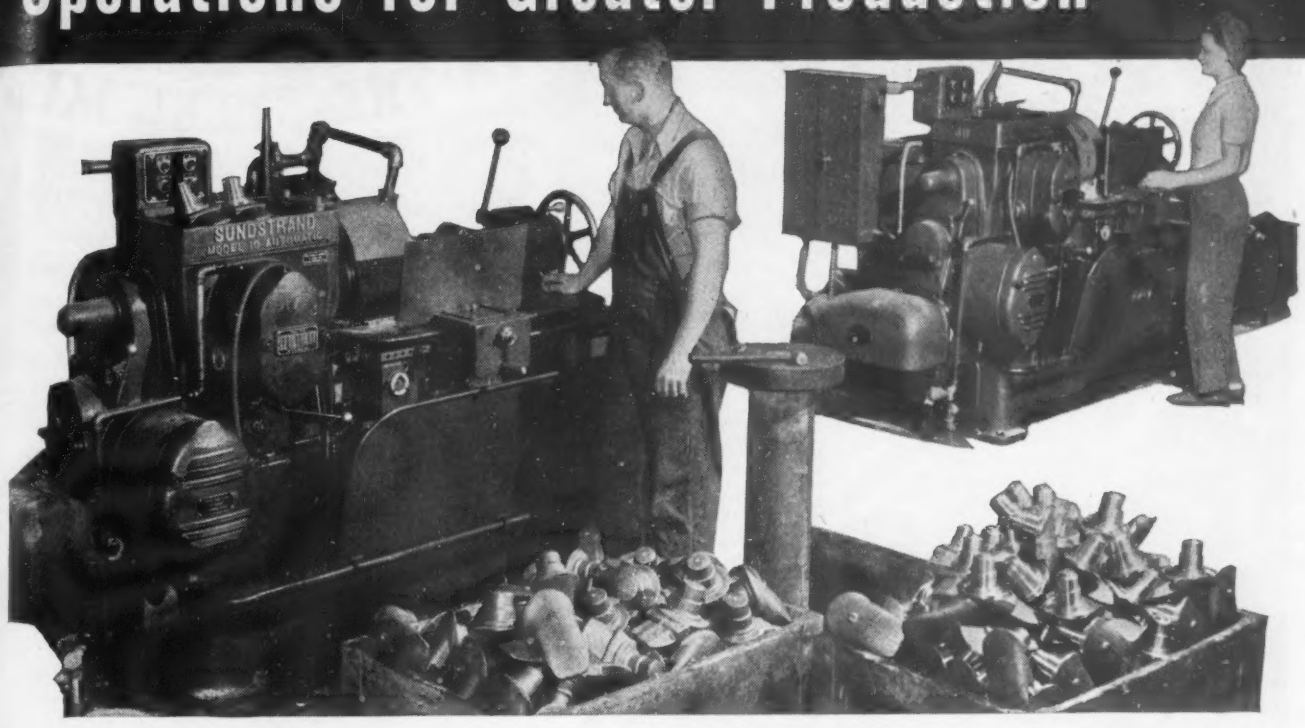


3. **ASK A P-K ASSEMBLY ENGINEER** to go over your plans with you – to make sure you don't miss any chance to save. You'll find his advice unbiased, because Parker-Kalon makes all types of Self-tapping Screws. Or, send assembly details for recommendations. Parker-Kalon Corporation, 208 Varick St., New York 14, New York.

PARKER-KALON
Quality-Controlled
SELF-TAPPING SCREWS

For Every Metal and Plastic Assembly

How to "Multiple Tool" Your Turning Operations for Greater Production



PRODUCTION INCREASED OVER *10 times* ON RUN OF *400 pieces*

● Here's an excellent example of how Sundstrand automatic lathes can be tooled to increase production over other turning equipment. This frame arm was formerly turned at the rate of four pieces per hour. Dividing the job into three operations, increased the production over ten times. Tungsten carbide tipped cutting tools are used for maximum metal removal. The quick cycle changeover feature of Sundstrand lathes makes it possible to process many other parts over these three machines at even greater savings in machining time.

3 SUNDSTRAND LATHES REPLACE *10* MACHINES

● More than ten of the type turning machines previously used would be required to produce the same amount of work produced by these three Sundstrand automatic lathes. In addition to this profitable increase in production, the customer finds they can secure accurately duplicated parts consistently. Further, the operator's duties are simplified due to the automatic machine cycle.

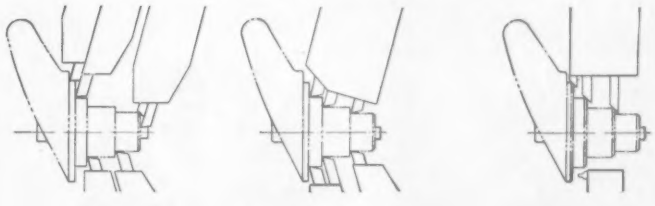
PROCESSING DATA

● Actual tooling of the job is shown below. Tooling diagrams illustrate how the complete job is divided into three separate operations.

OP. No. 1 • Rough turn, rough face and chamfer.
• Production—51 pieces per hour at 85% efficiency.

OP. No. 2 • Finish turn and finish face.
• Production—46 pieces per hour at 85% efficiency.

OP. No. 3 • Form ball race, groove and chamfer.
• Production—102 pieces per hour at 85% efficiency.



OP. No. 1 OP. No. 2 OP. No. 3

Free GUIDE TO FASTER TURNING OF BOTH LONG AND SHORT RUN WORK

● This 44 page booklet shows how Sundstrand engineered production has been successfully applied to modern turning problems. Both long and short run turning jobs are included with factual tooling and production information taken directly from the field. Write for your copy today. Ask for bulletin 739.

ARMY-NAVY E

SUNDSTRAND MACHINE TOOL CO. ROCKFORD ILLINOIS U.S.A.

SUNDSTRAND
MACHINE TOOL COMPANY

2540 Eleventh St. • Rockford, Ill., U. S. A.

RIGIDMILLS • AUTOMATIC LATHES • SPECIAL MILLING AND TURNING MACHINES

JEFFREY CHAINS IN THE STEEL MILL

HOT COIL CONVEYORS

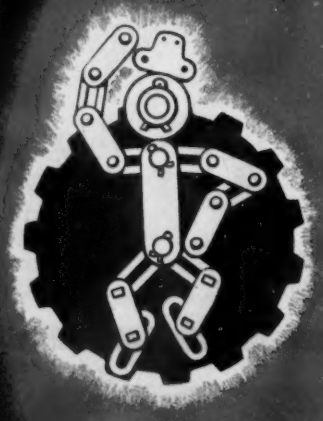
It is our business to know and help you solve your steel mill conveying problems . . . for instance, your job of handling heavy coils of sheet, hot from the coilers.

Your Jeffrey chain engineers appreciate what a hot coil conveyor failure means to you . . . shutdown . . . disastrous loss. So Jeffrey coil conveyor chains are built up to their job . . . made rugged for maximum surety against failure. They are precision built of proper steels . . . are of balanced design . . . and heat treated accurately.

A pair of Jeffrey coil conveyor chains will carry loads of hundreds of tons . . . will resist wear and heat . . . hold their pitch . . . last longer.

Equally effective are the Jeffrey chains for sheet transfer tables . . . pallet conveyors . . . slab transfer and crop conveyors . . . and other equipment in your steel plant.

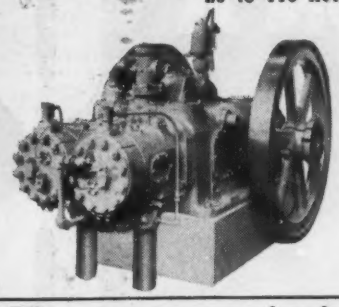
You will find it to your advantage to consult with Jeffrey engineers on your chain and conveying problems.



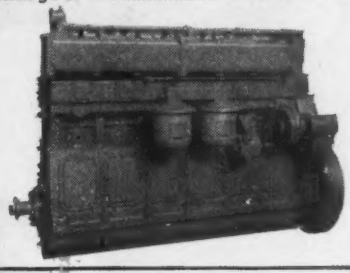
Jeffrey

THE JEFFREY MANUFACTURING COMPANY
Established 1877
925-99 North Fourth Street
COLUMBUS 16, OHIO.

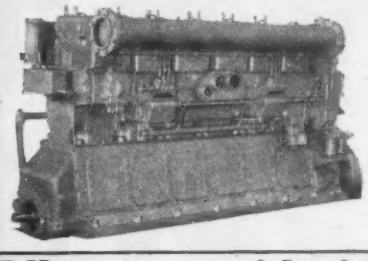
TYPE GA ..... 1 or 2 cylinders
25 to 110 horsepower



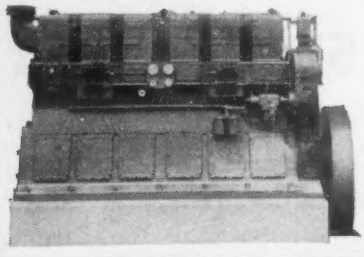
TYPE EN ..... 6 or 8 cylinders
Atmospheric ..... 135 to 400 horsepower
Supercharged ..... 185 to 550 horsepower



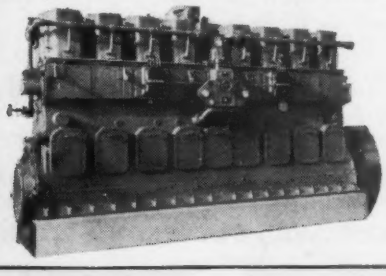
TYPE GS ..... 5, 6, 7, or 8 cylinders
Atmospheric ..... 290 to 750 horsepower
Supercharged ..... 310 to 1000 horsepower



TYPE JS ..... 6, 7, or 8 cylinders
Atmospheric ..... 410 to 930 horsepower
Supercharged ..... 550 to 1260 horsepower



TYPE LS ..... 6, 7, or 8 cylinders
Atmospheric ..... 650 to 1280 horsepower
Supercharged ..... 880 to 1730 horsepower



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If your power requirements fall between 25 to 1800 horsepower, there is an efficient, long-lived Cooper-Bessemer diesel exactly suited to your needs. Cooper-Bessemer diesel generating sets and direct-drive diesels are widely used throughout industrial America wherever low-cost power, simplified operation, and trouble-free performance under continuous service are essential.

A few of the Cooper-Bessemer diesels are shown here. All the vertical engines are available supercharged which affords up to 50 percent increased horsepower without increasing engine space requirements.

Particularly significant in industrial applications, Cooper-Bessemer diesels can be furnished to operate with equal efficiency on either gas or customary oil fuels, or on virtually any combination of both at will. They may be changed instantaneously from one fuel to the other at full load without even reducing speed.

This revolutionary Cooper-Bessemer development permits remarkable fuel economies. Gas fuel can often be supplied at sharply reduced cost throughout the long off-peak season.

If you are interested in reduced operating costs and year after year of dependable, uninterrupted power service, contact the nearest Cooper-Bessemer office for bulletins and complete details on the proper diesel set-up for your needs.

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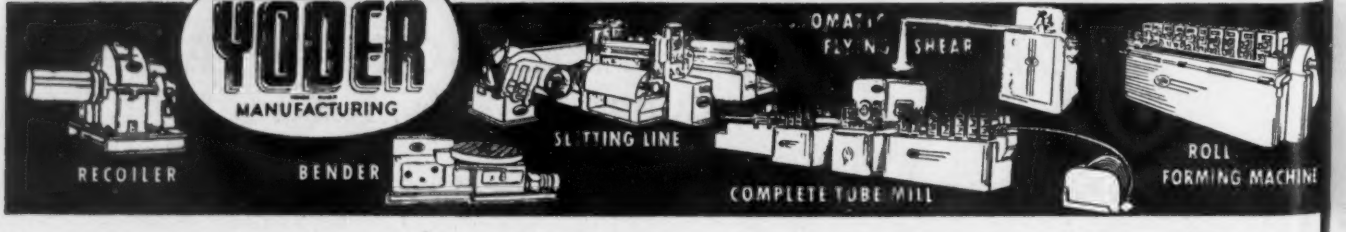

IF YOUR PRODUCT CALLS FOR ELECTRIC WELDED STEEL TUBING ★★★★★

GET IN TOUCH WITH US

Whatever your problem in ELECTRIC WELDED STEEL TUBING... mechanical, structural or pressure application... it will pay you to investigate our facilities. We are equipped to furnish this material in the diameters and gauges shown in the table at the right, and in many intermediate sizes. Highest quality workmanship. Prompt attention to every inquiry—large or small. Let us help you. For further information, contact our representative in your area, or write us direct.

SIZE AND THICKNESS CHART

★ ★ ★ ★ ★

TUBE DIAMETER	MAXIMUM WALL		MINIMUM WALL	
*O.D. SIZE	DECIMAL	GAUGE	DECIMAL	B.W. GAUGE
1/4"	.065"	16	.028"	22
3/8"	.065"	16	.028"	22
1/2"	.065"	16	.028"	22
5/8"	.065"	16	.028"	22
3/4"	.065"	16	.028"	22
7/8"	.065"	16	.028"	22
1"	.095"	13	.028"	22
1-1/8"	.083"	14	.028"	22
1-1/4"	.095"	13	.028"	22
1-3/8"	.095"	13	.035"	20
1-1/2"	.109"	12	.035"	20
1-5/8"	.120"	11	.035"	20
1-3/4"	.120"	11	.035"	20
1-7/8"	.120"	11	.035"	20
2"	.165"	8	.035"	20
2-1/4"	.180"	7	.035"	20
2-1/2"	.203"	6	.035"	20
2-3/4"	.203"	6	.049"	18
3"	.220"	5	.049"	18
3-1/4"	.220"	5	.065"	16
3-1/2"	.238"	4	.065"	16
3-3/4"	.238"	4	.065"	16
4"	.250"	3	.065"	16
4-1/4"	.250"	3	.065"	16
4-1/2"	.250"	3	.065"	16
4-3/4"	.250"	3	.065"	16
5-1/2"	.134"	10	.083"	14

*Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.

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Detroit 3, Michigan

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CORROSION RESISTANT

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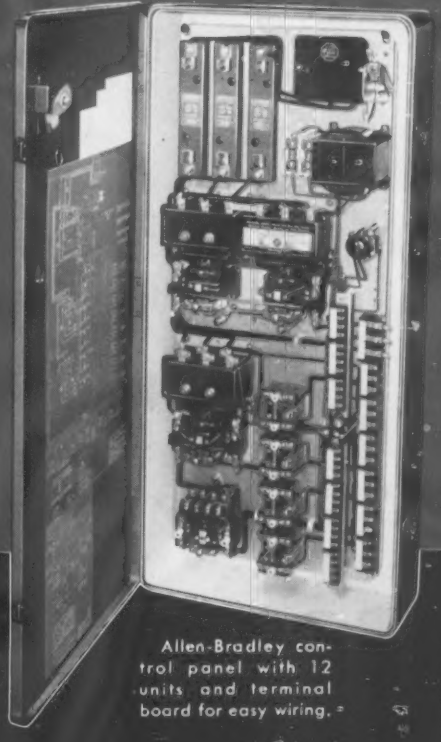
Also NICKEL, COPPER, BRASS, BRONZE, ZINC ANODES • BRIGHT NICKEL • PLATERS' SUPPLIES • WELDING RODS

ANOTHER SHIPMENT of MODERN TOOLS

equipped with Allen-Bradley Special Control Panels

THIS shipment of Snyder profile milling machines shows how leading machinery manufacturers are standardizing on Allen-Bradley special control panels. Today, all control units of a modern machine tool, such as contactors, relays, and disconnect units, are assembled on one panel in a neat steel cabinet. Push buttons are then mounted to be convenient for the operator, while limit switches are installed where required to govern the sequence operation of the machine.

Your machines can be streamlined . . . and performance often improved . . . with A-B special control panels. An Allen-Bradley engineer will gladly study your equipment and discuss a special panel layout to fit your needs. There is no obligation.



Allen-Bradley control panel with 12 units and terminal board for easy wiring.

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SOLENOID MOTOR CONTROLS FOR ALL INDUSTRIES

QUALITY

Are you familiar with Allen-Bradley Precision Limit Switches . . . those rugged but highly sensitive units for precision control of sequence operations? Send for Bulletin 802.

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Limit switches are so important in automatic motor control that it takes 72 pages in the Allen-Bradley catalog to list all the latest developments in A-B limit switches. An additional special 24-page technical bulletin tells how and how-not to install them.

Let us send you this 96-page limit switch catalog for your file. It is full of valuable suggestions, diagrams, and pictures . . . just what every machinery engineer needs to solve unusual motor control problems. And for the tough jobs call your nearest Allen-Bradley engineer. There is no obligation.

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A-B Quality

ALLEN-BRADLEY

LIMIT SWITCHES FOR EVERY SERVICE

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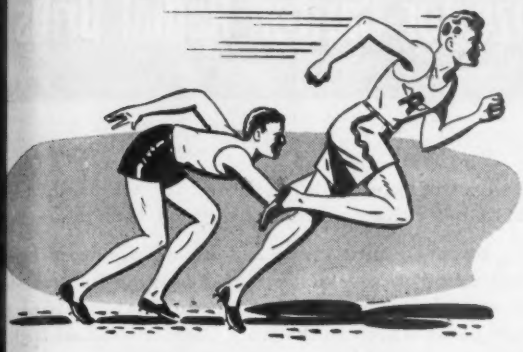
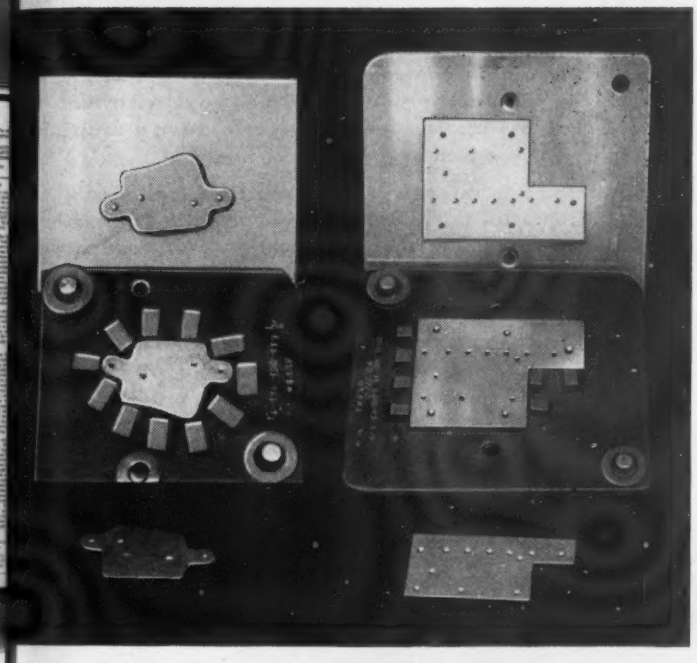
YOU GET OFF TO A *Head Start* WITH ALGOMA TEMPLATE DIES!

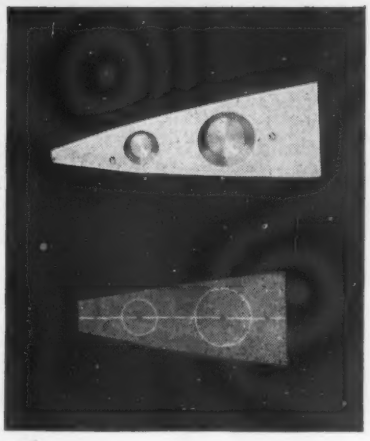




Almost ready while you wait . . . Algoma's dies, sawed from special alloy steel, sheered and filed to size, hardened and welded to inexpensive backplates . . . and there you are, dies in ¼ the time at ⅓ the cost . . . you're in production . . . "superfast." Pierce punches are individually replaceable, are of hardened and drawn tool steel and pressed into the blank die for piercing the holes in the part, adding life to Algoma dies. No matter what your problem, talk it over with us. We're sure there's an Algoma die to do your job.

ALGOMA HYDRO-FORM BLOCKS FOR FAST DELIVERY

Hydro-Form Blocks are made from hot rolled boiler plate, machined and polished to prevent scratching of parts. Mounted in the press with rubber blocks they are furnished complete with pilot pins for location of parts. They are made to your specifications.



GET QUICK ACTION . . .
TELL US THREE THINGS . . .

The metal, the gauge, the size of the run. Send a template of the part. That's all . . . you'll get a figure fast. An opportunity to prove our assertions about Algoma Template Dies is all we ask.

FOR A HEAD START, BE WISE
SPECIFY ALGOMA TEMPLATE DIES

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Lodge & Shipley Lathes *at work*

producing parts of every type and size for Carlton Radial Drills

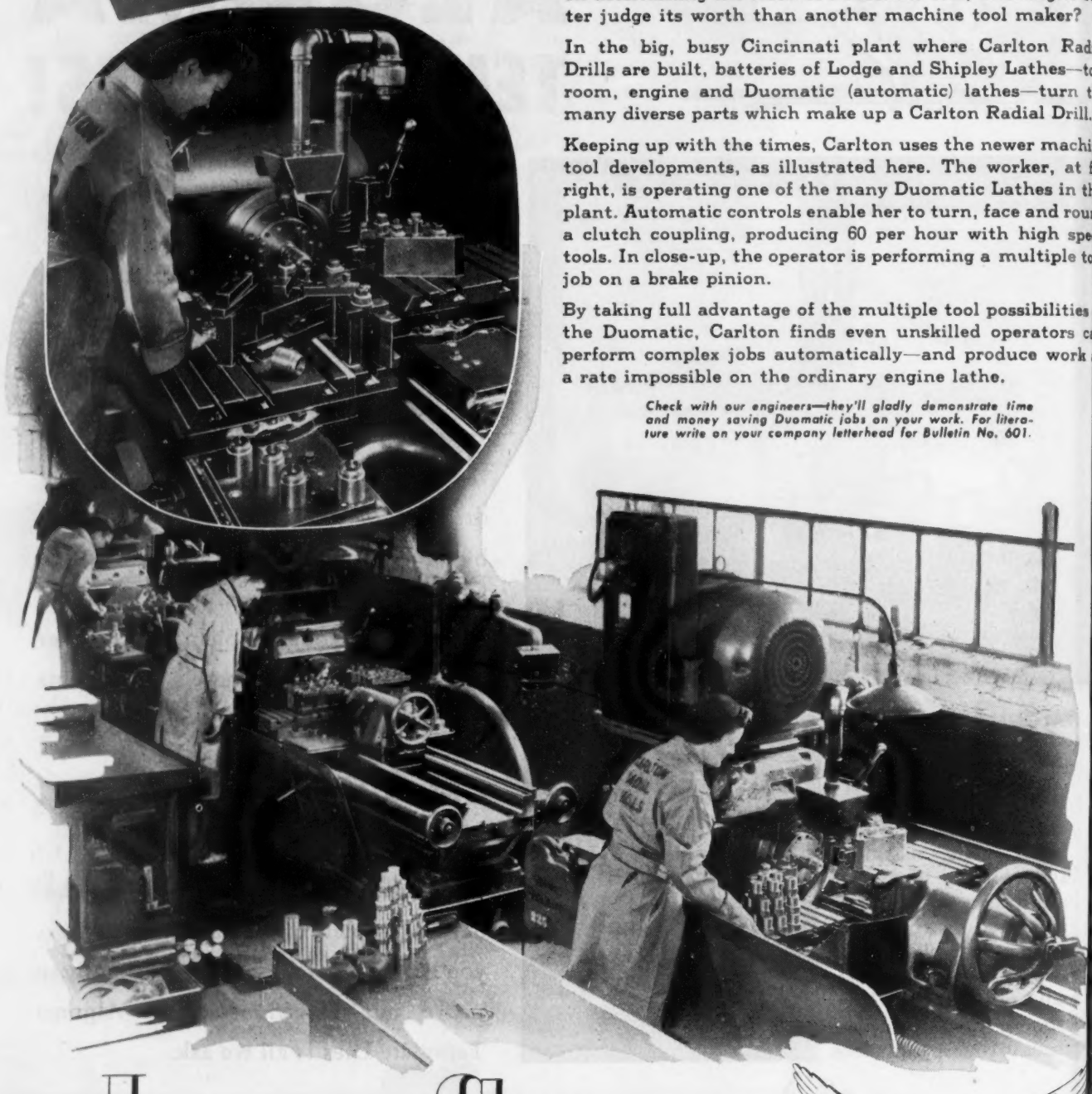
In determining the value of a machine tool, who might be ter judge its worth than another machine tool maker?

In the big, busy Cincinnati plant where Carlton Radi Drills are built, batteries of Lodge and Shipley Lathes—to room, engine and Duomatic (automatic) lathes—turn t many diverse parts which make up a Carlton Radial Drill.

Keeping up with the times, Carlton uses the newer machi tool developments, as illustrated here. The worker, at right, is operating one of the many Duomatic Lathes in th plant. Automatic controls enable her to turn, face and rou a clutch coupling, producing 60 per hour with high spe tools. In close-up, the operator is performing a multiple to job on a brake pinion.

By taking full advantage of the multiple tool possibilities the Duomatic, Carlton finds even unskilled operators c perform complex jobs automatically—and produce work a rate impossible on the ordinary engine lathe.

Check with our engineers—they'll gladly demonstrate time and money saving Duomatic jobs on your work. For literature write on your company letterhead for Bulletin No. 601.

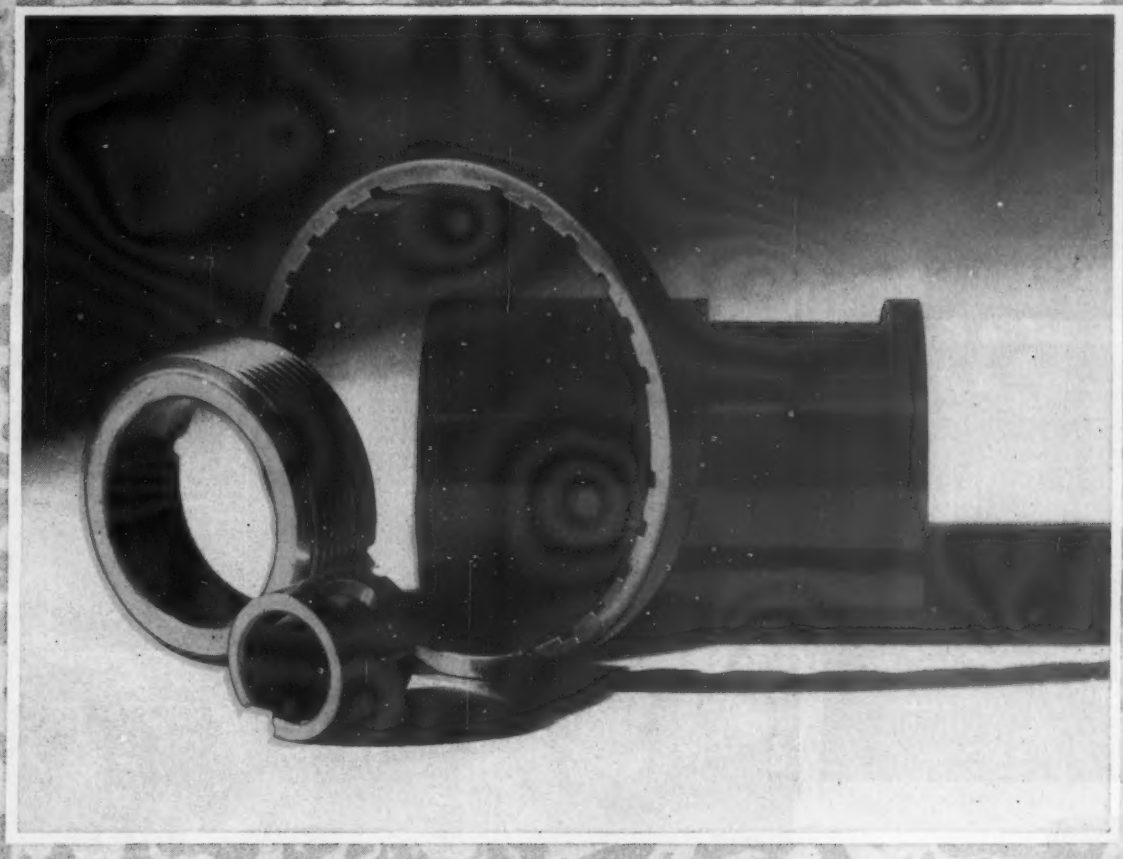


THE LODGE & SHIPLEY MACHINE TOOL CO

CINCINNATI 25, OHIO, U. S. A.

L & S LATHES

ENGINE—TOOL ROOM—AUTOMATIC—OIL COUNTRY LATHES



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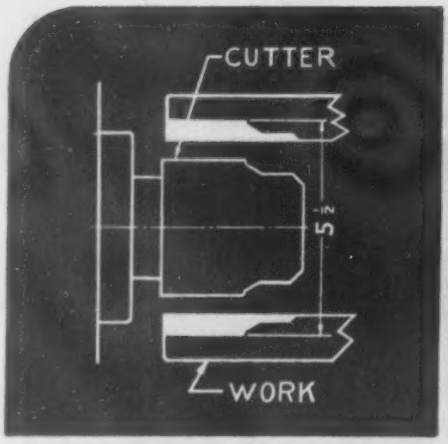

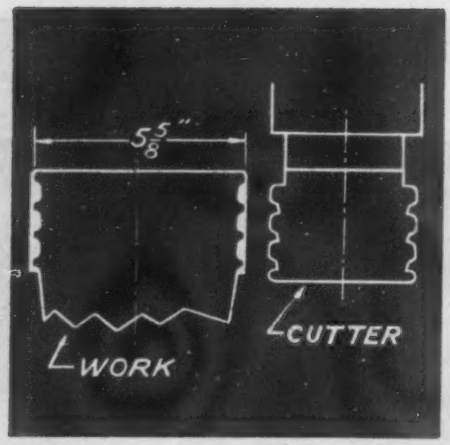

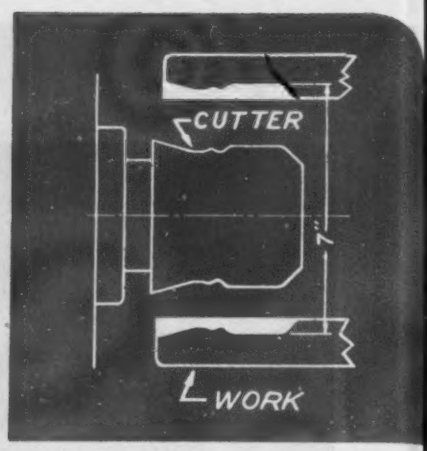

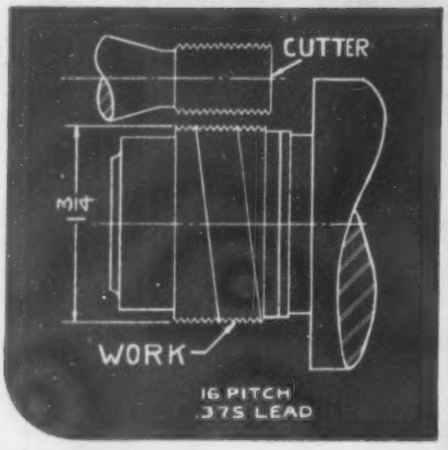

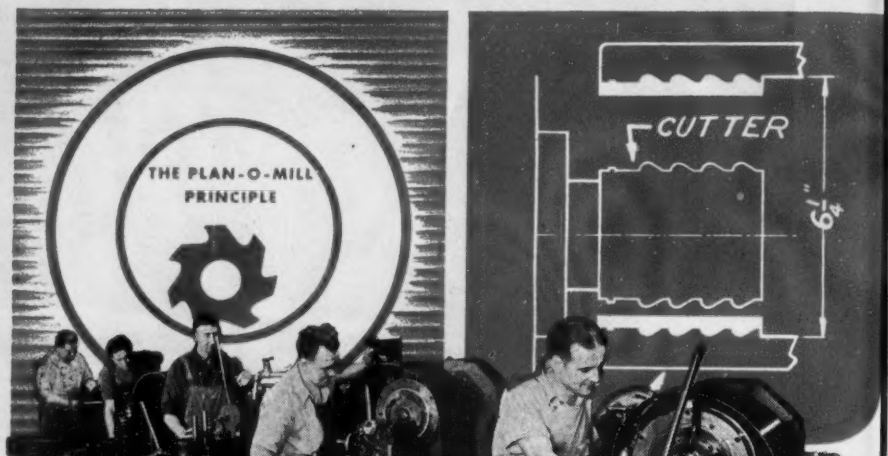

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Prosperity Tomorrow—
LOOK TO PLAN-O-MILL

For exceptional speed, accuracy and finish—at a saving of money, metal and manpower—look to Plan-O-Mill!

Plan-O-Mill provides a *better* method of form and thread milling. Plan-O-Mill offers outstanding rapid-production features, including General Electric's Thy-mo-trol for separate and complete control of feed-in and feed-around. Plan-O-Mill requires a minimum of skill to operate, a minimum of operator attention.

Shown above are typical examples of Plan-O-Mill production applications. If your war or post-war products involve internal or external threading or cylindrical forming, replace obsolete, wasteful machines with Plan-O-Mill. Contact your machinery dealer or write direct.

Firsts

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FIRST to install General Electric's remarkable new Thy-mo-trol—electronic feed control!

FIRST planetary to mill external threads with standard multiple thread cutter!

FIRST planetary to coordinate feeds and speeds!

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THREAD AND FORM PLAN-CD MILLING CUTTERS

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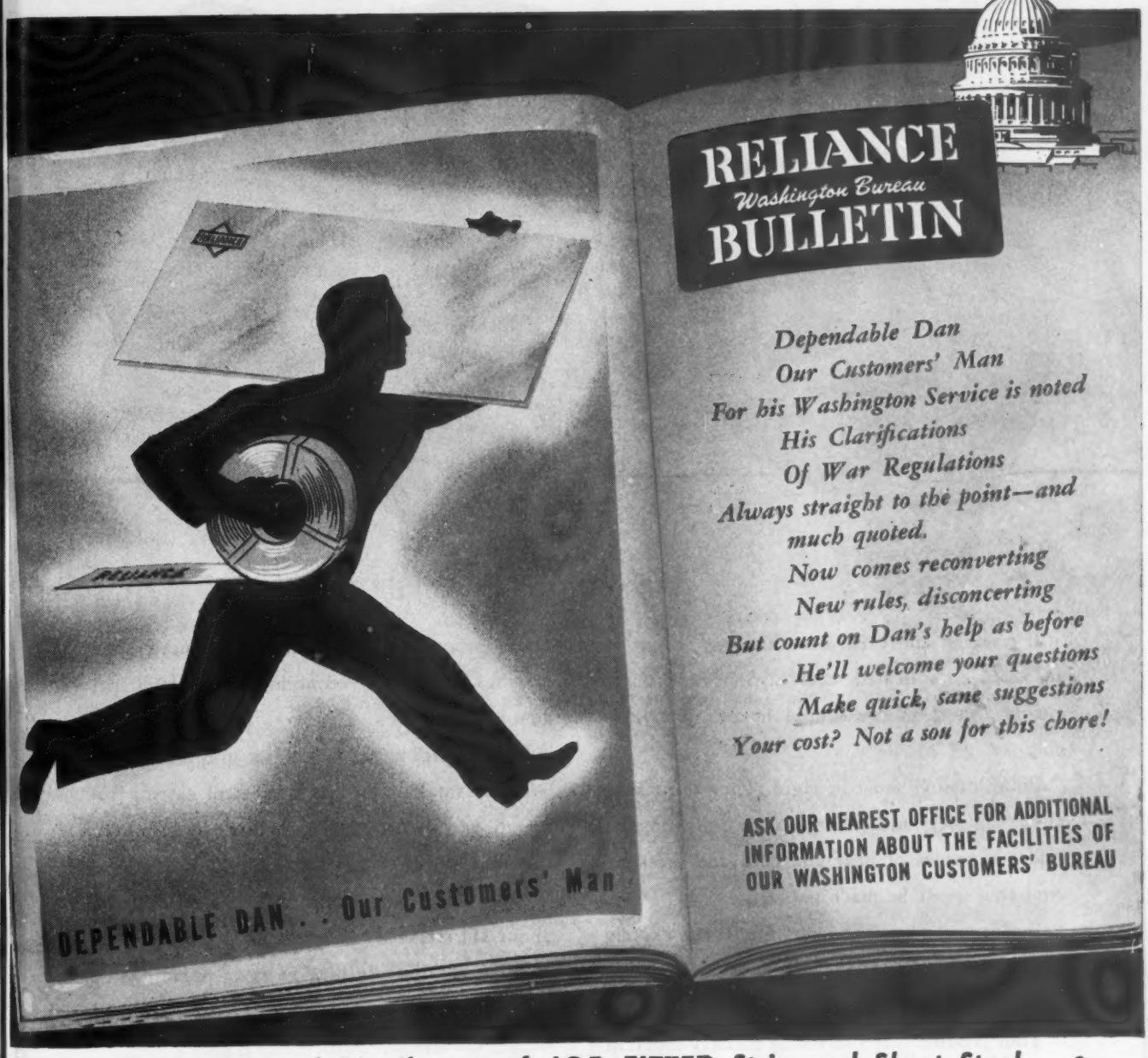
Established June 1940 — 6th Consecutive Year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Your cost? Not a sou for this chore!
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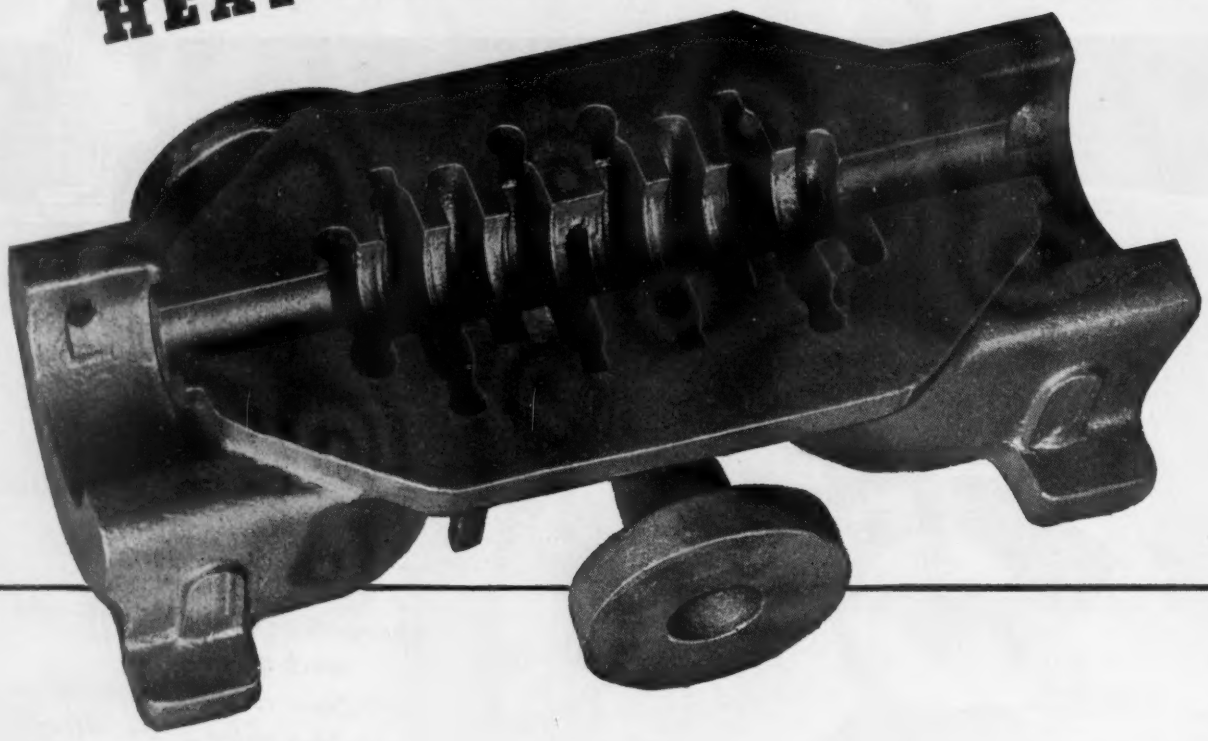

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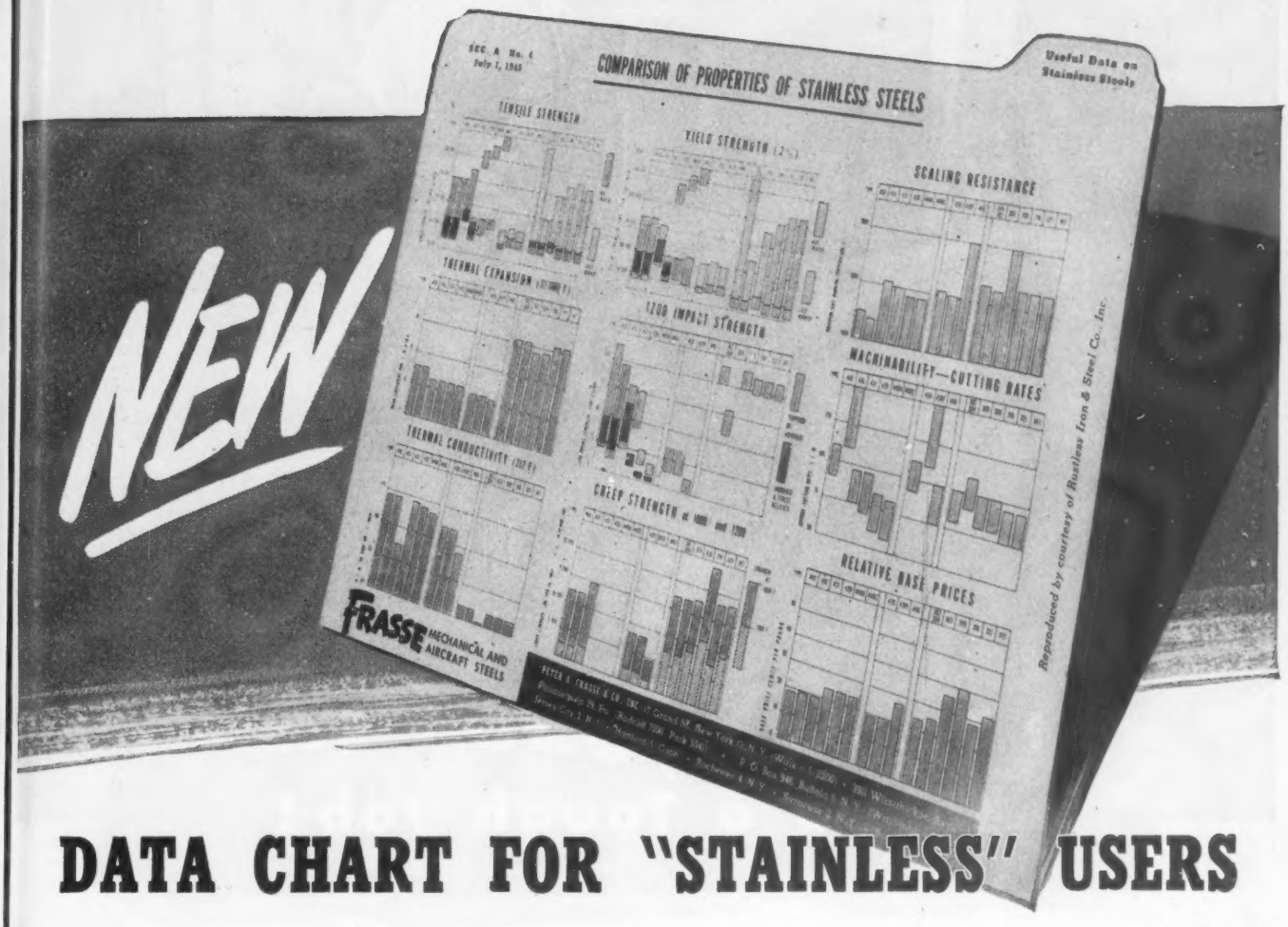

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STEEL

The Magazine of Metalworking and Metalproducing

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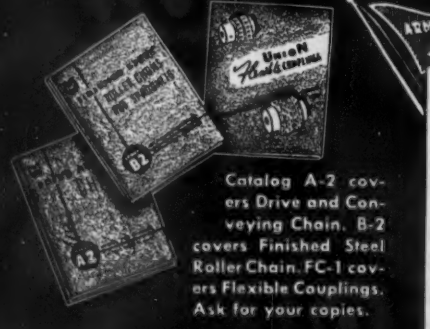

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STEEL
Aug. 6, 1945

Lesson From Britain

Ever since the British election, numerous commentators and public officials in the United States have made much of the idea that the swing to the left in England justifies a corresponding shift in our country. They say the British overturn will encourage the Labor-New Deal coalition to press harder for social reform and that it may cause President Truman to bear more toward the left. Some members of Congress are using the British election as an argument for expanding social security.

From this enthusiasm to exploit the British reversal in the United States, one would think that our English cousins had found the key to Utopia. As a matter of cold fact, they have made a painful decision. They have been appraising the postwar economic prospects of Britain and have found them gloomy. They have been contemplating the problem of regaining a dominant position in foreign trade and are shocked by the difficulties of trying to revive this trade under the handicaps of depleted finances and shipping and of certain industries—coal, for instance—which are too backward to produce efficiently or to pay decent wages.

So discouraging is the prospect under the domestic policies pursued during the past decade that the British people, although conservative at heart, feel they are forced to try an alternative. They are turning leftward to invoke more government controls because private enterprise has not been effective.

If the situation in the United States were as acute as it is in war-weary Britain, then there might be some excuse for applying the desperate British remedy. But our situation is not acute. On the contrary, our prospect for stability on a high level for some years to come are bright. None of our important industries is decadent. Private enterprise in the United States is not so feeble that it must be shelved in favor of nationalization. A survey by the Department of Commerce shows that 7000 manufacturers and the railroads and utilities have $10,500,000,000 ready to spend for new plants, equipment, material and supplies as soon as regulatory, manpower and other restrictions permit.

Where in all the world is there a potential for jobs and economic well-being as great or as promising as this? No nationalization project anywhere can match these chips held by private enterprise.

The lesson of the British election for us is to keep private enterprise strong. Save it from strangulation by regulation. Encourage it to prosper and to serve the public satisfactorily.

CO-ORDINATION NEEDED: Too little attention in high places is being given to the challenges embodied in the prospective situations in coal and transportation.

Secretary Ickes says we should ship 6,000,000 tons of coal to Europe to prevent anarchy this winter. His argument is convincing. At the same time, Dr. C. J. Potter, deputy solid fuels administrator, is warning that the shortage of coal may force industry, including steel mills, to go on a 4-day week. Ickes has been consistent in telling the public it will have 80 per cent or less of last year's coal supply for next winter's home heating.

The transportation situation, already acute, probably will get worse before it can improve. It is due to the unprecedented heavy traffic and the transfer of men from the European to the Asiatic theaters of war.

In coal and transportation, early relief could be forthcoming if the Army could release coal miners and railroad men from military service. Army officers have promised some slight relief, but they

(OVER)

complain that such releases play havoc with the point system for discharge.

Here is a case where good co-ordination at the top in Washington could avert a calamity. It presents a challenge to and an opportunity for the Truman appointees to prove anew the adage that a new broom sweeps clean. —p. 87.

• • •

CURB ON BIG BUSINESS: Uncle Sam is in business in a big way. There are 101 separate government corporations engaged in production, transportation, generation of power, loans, housing, insurance and other lines of business. These corporations have gross assets of $29.6 billion and liabilities of $28.4 billion.

Alarmed at the free and easy manner in which such government corporations can be created and operated, the House Committee to Investigate Expenditures in the Executive Departments has introduced H.R. 3660, a bill that would require all government corporations to be established by an act of Congress. The bill also would put an end to all government corporations after June 30, 1948, unless they had obtained congressional authority to incorporate under federal charter. The bill also provides for budgetary controls and periodic commercial-type audits.

This bill should help President Truman in his apparent determination to introduce more business-like methods in government. With administration approval it could be passed by both houses easily. The sooner it becomes a law, the better. —p. 95

• • •

COMPLICATED RULING: An adjustment in the prices of cold-finished carbon steel bars effective Aug. 6 deserves special attention because it is the first compensatory price ruling applied by OPA to iron and steel products since the present system of government price control was inaugurated.

The adjustment involves an increase of $2 per ton in the base price of cold-finished bars and a reduction of $6 per ton in the extra for strain and stress relieving and a reduction of $2 per ton in the extra for physical inspection and testing.

No matter how carefully this price ruling may have been worked out, it is obvious that to apply such a complicated solution to all price problems in iron and steel is an endless job and one that probably will fall far short of being fair to all interests concerned. One must hope that the need for price control will pass before the rules become more complicated. —p. 86

SIGNS OF THE TIMES: Ability of structural steel to absorb dynamic forces greatly in excess of those anticipated in normal structural design was demonstrated by the unfortunate accident in which a B-25 bomber, traveling at from 250 to 300 miles per hour (p. 88), crashed into the Empire State Building at the 78th and 79th floors. Examination shows that the structural damage was minor and that the several spandrel beams distorted by the impact can be replaced with comparative ease. . . . The new Attlee government, committed to a broad program of nationalization, probably will start with coal mining (p. 83), which is in a dismal state of decadence. Next will come railroads, whose operators desire nationalization, air transport and public utilities. There will be stiff opposition to nationalizing British iron and steel. . . . According to the 1945-46 edition of Penton's Foundry List, just published, the number of foundries in the United States and Canada has increased from 5295 in 1943 to 5569 in 1945 (p. 90), a gain of 274 or about 5 per cent in two years. The increase in capacity during this period has been greater than indicated by the gain in number of foundries, owing to the fact many of the new ferrous foundries are large and numerous old ones have been enlarged and modernized. . . . The first of four ore carriers being built by Bethlehem Steel for its own use has started for Chile via the Panama Canal (p. 89) for the first load of Chilean ore to be brought to the states from Chile in several years. . . . Senator Walter F. George, chairman of the Senate Finance Committee, believes the federal government will be spending from $22 to $25 billion annually for a year or two after the war ends (p. 91) and after that the amount will depend upon conditions and factors now incalculable. The $22 billion is the lowest figure yet attributed to a responsible spokesman. . . . A Bendix Aviation Corp. executive predicts that there will be 3,500,000 licensed private airplane pilots in the United States by 1960 (p. 108) if progress made since 1929 continues at the same rate during the next 15 years. This seems incredible, yet the estimate probably is conservative and certainly is significant. . . . Curtiss-Wright's new V-Tab, a simple control surface for cargo planes (p. 106) will permit loading without consideration of how weight distribution affects center of gravity.

E. L. Shaner

EDITOR-IN-CHIEF

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STEEL
August 6, 1945

British Election Means Swing to Left

Labor party committed to nationalization of industry. Government controls will be maintained to greater extent and for longer period than planned by Conservatives. New regime faces difficult problems in reconstruction, handicapped by strained economy, loss of overseas investments and shipping. International effects of program, should it mature, difficult to assess

By VINCENT DELPORT
European Editor, STEEL

LONDON (by cable)

THE VICTORIOUS Labor party's program means reversal of the previous government's policy, which was to support private enterprise, to increase efficiency of major industries and to stimulate exports.

The new government probably will maintain controls to a greater extent and for a longer time than would have the Conservatives.

Labor is committed to nationalization of the coal mines, transport, electricity distribution, the iron and steel industry and the Bank of England.

Most probably it will begin with the coal mines as a public corporation. Miners are insistent in their demands for nationalization now. The program probably will mean the closing of the more inefficient mines and integration of the more productive mines now operated as individual units.

Nationalization of railroads, and air transport as public utility companies probably will follow. Railroad operatives want it. Electricity distribution may follow later, nationalization of iron and steel will be a tougher and more intricate proposition.

Referring especially to iron and steel, it is doubtful that Labor yet has a detailed plan. The industry is strongly organized to resist and meantime will carry out its own five-year plan. (See STEEL, July 30, p. 54).

Nationalization of the foundry and metalworking industries is most unlikely owing to the wide variety of products and the large number of small and medium-size concerns, although some action may be taken to eliminate small, inefficient firms unable to offer good wages and working conditions.

Such major transformations must take time and must have the approval of Parliament where strong opposition is expected—and not only from the Conservative side.

The new government also faces other weighty problems—rehousing, demobilization, national insurance legislation, and the responsibilities of office.

Should Labor's plans mature, it is impossible to assess the effect on the national economy, although the precedents are discouraging. It never has been tried on such a scale except in Russia where conditions are entirely different.

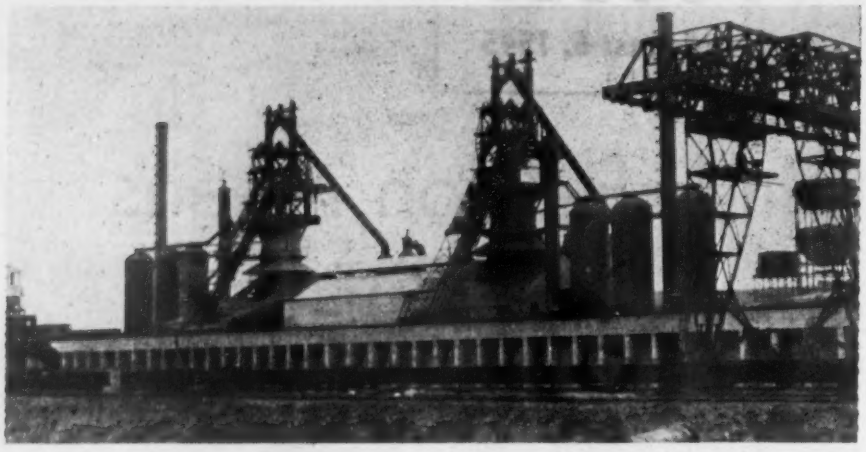
Regarding the effect on world steel trade, it appears likely all transactions would be through government agencies and that the tendency would be toward higher rather than lower prices.

Although the stock market reacted to the election news, there is no indication of panic. Generally it is believed cheap money will continue, but wages are almost certain to go higher and hours will be reduced with the usual effect on production costs.

Two leading figures in Britain's Labor government are Prime Minister Clement Attlee, above, and Foreign Minister Ernest Bevin, upper left, NEA photos

—o—

The two-to-one Labor vote gives to Clement Attlee, the new Prime Minister, a clear-cut majority and presages a fairly long life for the Labor government if it



Two of England's most modern blast furnaces are these stacks of the Appleby-Frodingham Steel Co. Ltd., at Scunthrope, completed shortly before the war

British Reconversion Limited, Awaits V-J

By J. A. HORTON
British Correspondent, STEEL

RECONVERSION of British industry will be limited until war in the Pacific is ended, although a partial resumption of civilian goods already is underway as availability of materials and manpower permits.

An extensive range of iron and steel products has been freed from the rule which forbids export except by special authorization of the Board of Trade. This is regarded as a step in the right direction and in keeping with the government's expressed intention of removing export licensing restrictions progressively, having regard to the situation in respect to supplies. The changed military situation is responsible for the fact that some of the articles now dealt with are in easier supply, but a warning is given that during the transitional period lack of manpower and manufacturing capacity may constitute difficulties in certain directions. Manufacturers are reminded that the overriding claims of the war against Japan and the need to send essential supplies to the Empire and other countries (including liberated territories) for which Britain has responsibility for certain supplies will mean

is successful in meeting Britain's difficult domestic and foreign problems.

Mr. Attlee is a socialist by conversion, being the son of a staunch Conservative. He was sent to Parliament in 1922, held various posts in the government and succeeded to the leadership of the Labor party in 1935. In the Churchill coalition cabinet he served as Deputy Prime Minister.

Among the key members of his cabinet will be:

Foreign Minister: Ernest Bevin, 64, a labor leader for many years, and Minister of Labor and National Services in the coalition cabinet.

Chancellor of the Exchequer: Hugh Dalton, 58, one of the Labor party's intellectuals, president of the Board of Trade in the coalition cabinet.

President of the Board of Trade: Sir Stafford Cripps, 56, a member of Parliament since 1931, brilliant radical lawyer, Churchill's ambassador to Russia and special envoy to India with England's proposals for self government, Lord Privy Seal and leader of commons in Churchill's war cabinet.

Lord Privy Seal: Arthur Greenwald, 65, a cabinet officer in many ministries since World War 1.

Lord President of the Council: Herbert Stanley Morrison, 57, one of the strong leaders of the Labor party who rose from errand boy and telephone operator to become a member of Parliament. He was Minister of Home Security and Home Secretary in Churchill's wartime cabinet.

Lord Chancellor: Sir William Jowitt, lawyer who once was expelled by the Labor party for supporting Ramsay MacDonald's National government. He was Paymaster General under Churchill, with special duties to plan postwar construction.

Little change in Britain's foreign policy as regards winning the war over Japan and setting up machinery to effectuate the peace appears likely. Adherence to the agreements already formulated is expected. Mr. Attlee was a delegate to the San Francisco conference and had been attending the Potsdam meetings before the election.

On the domestic front, Labor victory presages more radical changes. In addition to the program for nationalization of basic industries, the Laborites will press for far-reaching social reforms in housing, education, social security, employment and agriculture.

Many difficulties will face the new government in attaining the goals it has established, chief among which are an economy sorely strained by more than five years of war, by diminished foreign trade, loss of many overseas investments, loss of a large portion of its shipping and other international services.

Dock hands direct the unloading of the first Austin, British-built passenger car, to arrive in New York. England is attempting to build up export trade to restore her credit resources drained by the economic stress of war. NEA photo

Sir Stafford Cripps, President of the Board of Trade in England's Labor government, won the good will of industry during his wartime tenure in the Ministry of Aircraft Production, NEA photo

therefore, that many of the goods now removed from export licensing control will not be freely available for export for some time to come. Among these goods must be included steel sheets, for which makers are so heavily booked that they will not be able to accept substantial orders for export for some time. The relaxation, however, applies to angles, bars and rods, blooms, beams, hoop and strip, ingots and tubes and other products.

Whatever restrictions are relaxed, however, in regard to export licensing cannot alter the position in regard to manpower which at present is the vital factor, not only in the steel industry but throughout the whole of industrial Britain. The scarcity of skilled labor hampers progress everywhere and may continue to be a retarding influence in this transitional period for many months.

In the early part of the year there was a slump in the demand for steel plates, but specifications are now improving from shipyards, locomotive and car builders.

Plight of Industry Unrevealed

The enormous housing program which is to be put in hand first by local authorities and secondly by private enterprise augurs well for the producers of light castings.

The full story of the plight of the steel industry in Europe cannot yet be given. Belgium, it would appear from reports which trickle through, is suffering from a fuel shortage. Producers hope to secure at an early date iron ore from France and Luxemburg, and a first consignment of 10,000 tons of Ruhr coke has recently been made available for Belgian industry. It is believed that for some time a large proportion of the Belgian steel output will be reserved for the country's own needs. At present the works are producing between 40,000 and 50,000 metric tons of steel monthly. It is therefore very unlikely that Britain will be able to import from Belgium the very considerable tonnages of semifinished products as was the prewar custom.

M. Cyr. Van Overburgh, Belgian minister of state, writing recently in *Le Soir* (Brussels) said: "It is time to speak of the reparations that Germany must make to us. It is a question of reparations in kind such as raw materials including coal, wood, ores, certain fertilizers, dye-stuffs, metals, electrical power, machinery, locomotives, other railway material, ships, airplanes, loan of cattle, etc. On the principle of reparations our great Allies are in agreement. Germany must make reparations not in foreign currency as in 1919 but in kind. The amount of our direct damage has not yet been drawn up; as regards goods alone it exceeds 200 billion francs. If Germany supplied Belgium with 20,000,000 tons of coal annually for 15 years this would still only represent one-quarter of the reparations due. If it is natural that the Saar Basin should be reserved for France, it is only equitable that the exploitation of the Ruhr should be allotted in order of priority to Belgium, Holland and Luxemburg.

In France, the arrival of Ruhr coke has enabled more iron and steelworks to resume operations. The government has plans to reorganize and replan the iron and steel industry. Machine tools and industrial equipment are to be imported from the United States during the next two years, and France will probably need to import steel and other materials for some time to come. The output of raw steel in February was 58,000 metric tons against 55,000 tons in January and 46,000 tons in December, 1944. Pig iron production was only 9,600 tons in February.

Criticism was made recently by Ernest Bevin, now Foreign Minister, of high prices in the iron and steel industry. He accused manufacturers of charging what he described as enormous prices so that obsolete plants inside the "ring" can be kept in operation. A reply has been issued by the British Iron & Steel Federation which says that steel prices are fixed by the government and the war has delayed the modernization of plant. The price arrangements to which Mr. Bevin referred were set up at the government's request in the early stages of the war to equalize and restrict profits in the industry to insure that steel needed for the war effort would be forthcoming. The arrangements not only cover the problem of utilization of the more obsolete plant to insure greater production during the war, but also meet the position when efficient firms are called upon to use unsuitable raw material and produce unusual products for which their plant was not intended.

As for Mr. Bevin's contention that steel prices in the United States are less than those prevailing in Britain, this is merely because in addition to the foregoing the steel industry, in common with the rest of British industry, has been carrying a war burden of insurance, interruption of supplies due to enemy action and other exceptional wartime charges unknown in U. S. The greatest single factor in price is the wartime increase in coal costs. Coke used in blast furnaces has risen by 137 per cent. Quite apart from the Ebbw Vale scheme other schemes of modernization in the industry had been completed. Others were in the process of being carried out when the war interrupted them.

Weakest spot in production was probably ironmaking. By 1930 Britain had fallen behind in blast furnace practice, but this position has now been remedied, and the majority of blast furnaces are as good as any in the world. The magnitude of the change is illustrated by the fact that 98 blast furnaces in Britain today produce approximately the same tonnage as 158 in 1929.

The federation statement concludes—"Critics of the industry's technical efficiency are apt to overlook the fact that the industry in Britain is designed to fulfill the requirements of our vast jobbing trade with the rest of the world. The long runs in the extensively integrated U. S. iron and steel plants are suitable for U. S. requirements, but it does not follow that the kind of production undertaken in U. S. is the right thing for Britain. On the contrary, our requirements are of a totally different character."

Adjusts Cold-Finished Bar Schedule

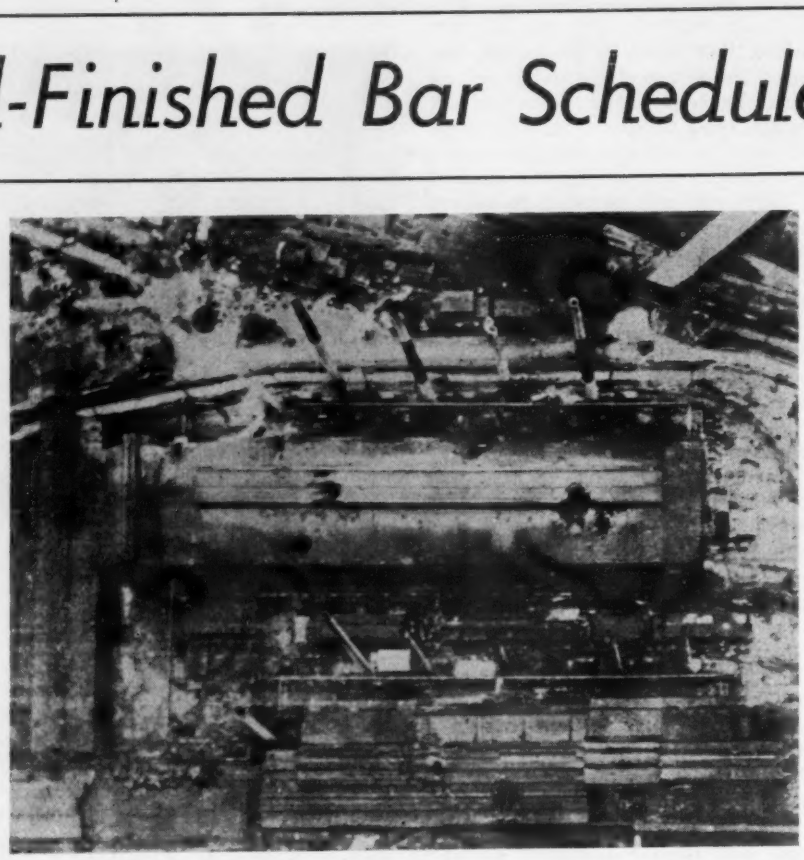
OPA effects $2 per ton increase in base prices but lowers certain extras as offset. Move designed to aid smaller producers

IN A SOMEWHAT complicated action last week, the Office of Price Administration announced an adjustment in the cold-finished carbon steel bar price schedule, effective Aug. 6.

The action, amendment 14 to price schedule No. 6, included the raising of base prices by $2 per ton to restore the historical spread between cold-finished and hot-rolled carbon bars erased last May when hot-rolled bars were upped $2 per ton without a corresponding increase on cold-finished. As an offset to the increase in base prices on cold-finished, however, OPA ordered a reduction of $6 per ton in the extra for strain and stress relieving, and a cut of $2 per ton in the extra for physical inspection and testing. The first named extra now will be $9 per net ton, while the physical testing extra will be $3 per net ton.

The increase in cold-finished carbon steel bar base price with simultaneous reduction in the two extra charges is particularly significant since it is the first compensatory price adjustment of its kind applying on iron and steel products since the beginning of government price control.

Net drop in the industry's profit margin will result from the action though the cut in extras will affect largely the return on shell bars, production of which will not be an important factor in peacetime operations. Further, because of the fact some producers have not been equipped to charge these extras, the reduction will not apply to the entire industry.



BLASTED JAP STEELWORKS: Big holes in the roof area of the open-hearth building, at top, and the foundry building, at bottom, indicate damage caused to the Japanese steelworks at Kamaishi by big guns of the Third Fleet during bombardment of the Japanese home islands with fuzed shells, timed so they would explode after penetrating to the heart of the structure. U. S. Navy photo

Adjustment Relieves Hardship

The adjustment was made, OPA said, because profit margins in the industry, especially small producers, were inadequate to permit absorption of the May increase of $2 per ton in hot-rolled carbon bars plus other cost increases during recent years.

When the industry advisory committee petitioned OPA for a price adjustment last May it estimated 1,000,000 tons of cold-finished bars would be affected over the last seven months of this year by an increase of $2 per ton in the base price. It also estimated that 300,000 tons would be affected by a reduction of $6 per ton in the stress and strain extra, and 180,000 tons by a cut of $2 per ton in the inspection and testing extra. It is estimated, therefore, that as a result of the current adjustment the price advance will increase return to the industry by $2 million while the cut in extras will decrease the return by $2,160,000.

OPA revealed that 24 companies produce practically 100 per cent of cold-finished bar output. Of these, five integrated steelmakers account for 40 per cent, five large nonintegrated producers for about 47 per cent, and 14 smaller nonintegrated companies for 13 per cent.

Rate of return on net worth for a normal peacetime period (1936-1939) for cold-finished bar producers is 13 per cent, substantially higher than the base period rate of 4.2 per cent for the steel industry as a whole, according to OPA. Higher profits are attributed to certain heat-treating, annealing and testing extras which were in effect in April, 1941, when prices were frozen, but which applied on a much smaller volume of work at that time. In 1942 these extras were voluntarily reduced $7 per ton by the producers. At the same time, states OPA, all producers do not enjoy the higher profits accruing through these extras, the smaller interests not having heat-treating facilities to process ordnance components. As a result these latter companies, in the main, are operating at or below their base period rate of return.

In order to make subsequent price adjustments to maintain a close balance, OPA now requires the filing of quarterly returns, setting forth tonnage figures so that OPA may regularly check the dollar increases granted against the dollar decreases allowed and make such periodic adjustments as may be necessary to attain true offsets. Quarterly financial reports also are required to be filed with OPA.

In conjunction with amendment of price schedule No. 6, OPA issued amendment 33 to price schedule 49, permitting warehouse steel distributors to increase their maximum prices for cold-finished carbon bars $2 a net ton.

Price Relief Inadequate, Small Steelmakers Protest

Unfair and arbitrary formulas employed by the Office of Price Administration in establishing maximum prices for carbon steel in 1945 fell so far short of reality they offset less than one-sixth of the indicated rise in steelmaking costs since 1939, a group of 23 small steel companies charged last

week in a formal protest to OPA against the schedule of carbon steel prices announced May 21.

The protest was filed by Robert W. Wolcott, president, Lukens Steel Co., Coatesville, Pa., acting on behalf of his own company and other smaller steel companies which, in the aggregate, accounted for about 4 million tons of steel in 1944.

Over the past six years, the labor cost of the protesting companies has increased by approximately $6,700,000 on the basis of 1939 output, while the cost of raw materials has risen an additional $8,250,000. As against that total increase of $14,950,000 in 1939 costs, the OPA in 1945 granted price relief equivalent to only $2,700,000 per year on the basis of 1939 volume.

The schedule of ceiling prices for steel announced May 21, 1945, by the OPA unfairly penalized small steel producers who do not own and derive profit from mines, blast furnaces and transportation facilities, the protest charges. Instead the schedule was predicated substantially upon costs prevailing among larger companies. Furthermore, in devising and applying its cost formula the OPA improperly excluded from consideration several important cost items, it is claimed.

Strikes Curb Production Seriously in Chicago Area

Unauthorized strikes and work stoppages over petty grievances continue to hold back war production seriously in steelworks, foundries and metalworking plants in the Chicago area.

The strike which started July 23 and affects 39 foundries in Chicago, Joliet, Batavia and Aurora, continues.

Five other strikes were brought to an end last week. Most important was at the Dodge Chicago plant, Chrysler Corp., where 20,000 workers went back to work July 30.

Approximately 1300 workers at Indiana Harbor, Ind., works of Inland Steel Co. resumed work last week after shutting down the tin mill. Strike started July 24.

A serious situation developed at the South Chicago plant of Republic Steel Corp., July 27, when 21 workers walked out, leaving hot metal in two tilting open hearths, subsequently forcing 3700 other workers into idleness. Normal work resumed July 30.

Operations at the Cicero, Ill., plant of National Malleable & Steel Castings Co., were reduced starting July 24 when 1650 workers remained away in protest against discharge of six employes. Work resumed July 31.

Production of over 15,000 gears for airplane engines was lost by Foote Bros. Gear & Machine Corp., Chicago, through a strike which 200 employees started July 30 and which later spread to include 1000. This strike terminated Aug. 1.

Ickes Sees Steel Output Curbed By 37 Million-ton Coal Shortage

PROSPECTIVE shortage of 37 million tons of coal this coming winter may force industry, including steel production, onto a 4-day week, Interior Secretary Ickes told a Senate committee last week. He declared some 30,000 miners now in the Army should be furloughed immediately so as to increase coal production to an adequate rate.

Supporting Secretary Ickes' position, Dr. C. J. Potter, deputy solid fuels administrator, told the committee he "expects all industry, including steel mills, will have to go on a 4-day week this winter unless more coal is produced."

Secretary Ickes recently recommended shipment of 6 million tons of coal to Europe to avert "chaos" there this winter.

Commenting on statements to the Senate Committee, Irving S. Olds, chairman, United States Steel Corp., last week said he did not anticipate any slowing down in his company's steel operations to a 4-day per week basis.

Recently Dr. Potter reported the average steel mill has only 16-day coal supply against a normal 30-day reserve. At that time he said one mill had only a 6-day supply.

Bituminous coal production in the week ended July 21, the latest data available, decreased approximately 380,000 tons from the preceding week, output totaling 11,620,000 tons. For the calendar year to July 21, production has amounted to 328,771,000 tons, or 23,813,000 tons less than in the like period of 1944. Current mine labor disturbances are causing considerable loss from week to week. Last week 35 bituminous mines employing 5799 men were affected by wildcat strikes.

Present, Past and Pending

■ ALLEGHENY LUDLUM OPENS BOOKS FOR CIVILIAN ORDERS

NEW YORK—Allegheny Ludlum Steel Corp. has opened its books for steel for civilian requirements and a substantial volume of business already has been placed, President Hiland G. Batchellor announced.

■ GUARANTEED WAGE INCLUDED IN UNION CONTRACT

NORRISTOWN, PA.—Wildman Mfg. Co., knitting machinery manufacturer, has agreed to guarantee 1200 hours of work annually, or pay at straight-time rates in lieu thereof, to all employees with five years of service with the company in a new union contract.

■ MANPOWER SHORTAGE STILL SERIOUS IN SOUTH

BIRMINGHAM—Workers are still needed in the steel, coal, lumber, textile and transport industries in the South, although a number of workers are reported idle as result of layoffs in other industries.

■ FLOW OF INDUSTRIAL EQUIPMENT TO CIVILIAN USERS SLOW

WASHINGTON—Heavy backlogs of unfilled orders and continuing military requirements are slowing the flow of general industrial equipment to civilian users, according to the War Production Board.

■ ANTICOLLISION SYSTEM MAY HELP PREVENT PLANE CRASHES

NEW YORK—Development of an anticollision system to prevent airplanes from crashing into tall buildings or other airplanes is disclosed by Panoramic Radio Corp., this city, and the Kollsman Aviation Instrument Divison, Square D Co., Elmhurst, N. Y. Device employs radio signals to warn pilots of obstructions ahead.

■ ACUTE LABOR SHORTAGE AREAS CONTINUE TO DECLINE

WASHINGTON—Areas of acute labor shortages now total 46, a drop of 27 from the V-E Day total of 73, according to War Manpower Commission.

■ ADDITIONAL SHEET STEEL FOR DRUMS DENIED

WASHINGTON—Request for 42,000 tons of additional sheet steel for production of steel drums during third quarter has been denied by War Production Board.

■ CHEVROLET TO CONCENTRATE AIRCRAFT ENGINE OUTPUT

BUFFALO—Chevrolet Motor Division, General Motors, will concentrate its aircraft engine production in this area to free other plants for civilian goods production.

■ NEW ENGLAND SHIPYARD EMPLOYMENT LOWER

BOSTON—Eight major New England shipyards report 103,077 workers have been laid off from peak employment. Only 99,100 are now employed by the yards.

U. S. Steel Chairman Says Industry Entitled to "Real" Price Relief

Speaking at corporation's quarterly meeting, he points out carbon steel prices have been upped an average of $1.50 per ton against cost increase of $8. Sees enough steel for automotive program. Income off in first six months of 1945

ASSERTING the steel industry is entitled to "real relief" on carbon steel prices, Irving S. Olds, chairman, United States Steel Corp., speaking at a press conference following the corporation's quarterly meeting last week, said increases in prices of $1.50 a ton have been averaged on the corporation's carbon steel products during the war emergency against increases in costs of $8 a ton.

The Steel corporation chairman revealed that while his company has received many cutbacks in orders, they, in themselves, have not affected overall operations. The corporation's main difficulty has been in obtaining adequate manpower, he declared. Labor disturbances also are an adverse factor. He estimated the corporation has lost 1,338,000 tons of steel this year through labor disturbances.

The Steel corporation has made no proposal for acquisition of the Geneva, Utah, steel properties, which it is now operating for the government, he said, declaring "The whole matter is still under consideration, but we have not yet arrived at any decision."

Responding to a question, Mr. Olds said he thought there should be sufficient steel to meet the 1945 civilian automobile program. He admitted there was a shortage in sheets and strip, but pointed out that the auto program for this year was not large.

Corporation backlogs are only slightly less than three months ago, although under present conditions, Mr. Olds added, he could not be sure how firm these backlogs are.

Reporting earnings of the corporation for second quarter of 1945, Mr. Olds announced income for second quarter, after all costs—including allowance for estimated federal taxes on income—but before declaration of dividends, amounted to $16,774,202. Income for the first six months of 1945 was $32,153,373, or $229,160 less than the reported income for the first six months of 1944.

Shipments of finished steel products in second quarter amounted to 5,123,714 net tons. For the first six months of 1945 shipments were 10,124,959 net tons, compared with 10,632,854 net tons shipped in the same period of 1944. Production of steel ingots and castings averaged 88.1 per cent of rated capacity.

Total capital expenditures during the second quarter, for additions to and betterments of fixed assets, were approximately $8,000,000. On June 30, 1945, unexpended balances for property additions and replacements amounted to approximately $133,000,000.

Net Profit of Youngstown Sheet & Tube Co. Rises

Net profit of Youngstown Sheet & Tube Co., Youngstown, O., for the second quarter of 1945 was $392,243 higher than that for the corresponding period of last year. The quarter's net profit this year was $2,190,260, compared with $1,798,017 for the second quarter of 1944.

Structural Damage to Empire State Building Slight in Bomber Crash

THE 102-story Empire State building, New York city, world's tallest building, withstood with minor damage the recent accident which occurred when an Army twin-engined B-25 bomber, traveling between 250 and 300 miles per hour, crashed into the 78th and 79th stories of the structure.

"While the forces delivered against the Empire State building by the heavy Army bomber, represent a tremendous potential for destruction, the structural damage actually sustained was very minor in nature, as indicated by newspaper reports," T. R. Higgins, director of engineering, American Institute of Steel Construction, said commenting upon the accident.

"The ability of structural steel to absorb dynamic forces, measured as foot-pounds of work, is many times the assignment given it in normal structural design. Thus the forces suddenly applied by the crashing plane were largely absorbed locally, with the distortion of no more than a couple of spandrel beams. And, having been absorbed into the steel frame, these forces were transmitted to the foundations more or less elastically."

The Empire State building required 58,300 tons of steel. The building was designed to withstand a wind pressure of 30 pounds per square foot, plus a pull of a dirigible. American Bridge Co. fabricated the steel and Post & McCord took charge of the erection. Starrett Bros. & Eken were the general contractors; Shreve, Lamb & Harmon, the architects; and H. G. Balcom Associates, the structural engineers. Starrett Bros. & Eken will assume charge of repairs. Only a relatively few new structural sections will be needed, and the ease with which damaged members may be removed will not be without significance.

Accompanying photo shows hole torn in wall of the building by the plane and firemen inspecting debris.

Grace Tells Why Bethlehem Is Not Interested in Geneva Steel Works

President of second largest steelmaking interest says Bethlehem can lay eastern-produced steel down on West Coast cheaper than it can produce it there. Notes some falling off in order backlogs but reports second quarter income gain

FOR THE first time for publication, Eugene G. Grace, president, Bethlehem Steel Corp., last week told why his organization is not interested in acquiring the steel plant at Geneva, Utah, owned by the government and operated by the United States Steel Corp. It is simply, he said, because Bethlehem can produce steel more cheaply in the East and lay it down more cheaply on the Pacific Coast than it can produce it out there.

Speaking at a press conference following the corporation's quarterly meeting, Mr. Grace explained Bethlehem has three steel plants on the Pacific Coast, with an aggregate ingot capacity of 500,000 tons annually — at Seattle, San Francisco and Los Angeles; also fabricating plants at San Francisco and Los Angeles.

However, Bethlehem over the years has been expanding its Sparrows Point, Md., plant with the requirements of the Pacific Coast in mind and it produces all of the important products required, except one, namely shapes, which are produced at Bethlehem, Pa.

With these facilities (including shape mills at Bethlehem), Mr. Grace said, "We can deliver products to the Pacific Coast, to the four major ports of Los Angeles, San Francisco, Seattle and Portland, cheaper than they can be made on the West Coast, and that applies to both the Geneva and Fontana, Calif., works."

With order backlogs shrinking about $200 million in second quarter, from $1,194 million to $995 million, there has been a reduction for the first time in the steel and heavy ordnance business, Mr. Grace asserted. About half the reduction was in ships (although there were no cancellations).

The corporation spent about $3 million for improvement during the last quarter, and now has an authorized expansion program of $80 million, compared with $74 million at the close of the first quarter. The program contemplates no expansion in steel production, but rather in steel processing and mining facilities.

Mr. Grace revealed that the first of four ore carriers being built by Bethlehem for its own use, had just started on its first voyage, heading for Chile by way of the Panama canal. There it will pick up iron ore from Bethlehem's accumulation. This load of ore will be the first in three or four years.

Net income in the second quarter was reported at $8,041,682 which compares with $7,695,909 in the first quarter and with $6,733,843 in the corresponding quarter of last year. Net income for the first six months of the year was $15,737,591 which compares with $13,166,381 in the like six months of 1944.

Steel Earnings

Jones & Laughlin Steel Corp. reports for second quarter of 1945 net income of $2,357,524 compared with $1,879,835 in the like 1944 period. In the first six months of this year net income was $4,371,013 compared with $3,588,187 in the first half of last year.

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Pittsburgh Steel Co. reports for the quarter ended June 30, net profit of $429,741, which compares with net profit of $192,718 in the preceding quarter and with a net loss of $187,840 in the corresponding quarter of 1944. Net profit for the first six months of 1945 was $622,459, comparing with a net loss of $72,901 in corresponding period of 1944.

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Inland Steel Co. reports second quarter net earnings of $2,943,490, which compares with $2,472,734 in like period of 1944. First half net income was reported at $5,416,224 compared with $5,171,418 in the like period of 1944.

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American Rolling Mill Co. reports for second quarter of 1945 net income of $2,071,925, which compares with $1,212,456 in the corresponding period of last year. First six months 1945 income is reported at $3,947,428 compared with $2,441,491 in the first half of 1944.

—o—

National Steel Corp. reports net earnings for the quarter ending June 30, of $3,453,183. This compares with net earnings of $2,863,315 in the second quarter of 1944. Net income for the six months ending June 30, 1945 was $6,883,171, compared with $5,413,458 for the first half of 1944.

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Sharon Steel Corp. reports for second quarter net profit of $364,793 which compares with $301,760 in first quarter.

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Continental Steel Corp. and subsidiaries reports for the quarter ended June 30 net profit of $208,672, which compares with $167,573 in the like period of 1944. Net for the first six months this year was $360,564 which compares with $323,379 in the first half of 1944.

Alloy Steel Production Lower in June

PRODUCTION of alloy and hot-topped carbon steel ingots in June totaled 1,960,969 net tons, compared with 2,233,422 tons in May, according to the American Iron & Steel Institute, New York.

	Total Steel		Alloy Steel		Carbon Ingots
OPEN-HEARTH FURNACES	JUNE	PER CENT CAPACITY	JUNE	YEAR TO DATE	Hot Top JUNE
Ingots	6,110,663	...	516,341	3,521,256	1,158,338
Steel for castings	18,603	...	3,899	24,831	.....
Total	6,129,266	88.5	520,240	3,546,087	1,158,338
BESSEMER INGOTS	379,807	78.6	.....	.....	.....
ELECTRIC & CRUCIBLE FURNACES					
Ingots	326,838	...	268,889	1,796,449	9,725
Steel for castings	6,379	...	3,777	28,159	.....
Total	333,217	74.2	272,666	1,824,608	9,725
Total Steel	6,842,290	87.1	792,906	5,370,695	1,168,063

June Pig Iron Output Shows Loss from May

JUNE pig iron production totaled 4,605,012 net tons, compared with 5,016,060 tons in May, according to the American Iron & Steel Institute, New York.

			Total		
	Pig iron	Ferro, Spiegel	June	Year to Date	Per Cent Capacity
Eastern	797,059	33,225	830,284	5,228,089	77.7
Pittsburgh-Youngstown	1,899,765	17,098	1,916,863	11,793,231	89.9
Cleveland-Detroit	463,997	....	463,997	2,973,562	85.6
Chicago	1,000,894	2,222	1,003,116	6,286,599	86.6
Southern	241,341	8,077	249,418	1,912,763	61.6
Western	141,334	.....	141,334	948,039	60.6
Total	4,544,390	60,622	4,605,012	29,142,283	83.1

Number of Foundries in U. S. and Canada, 5569, Up 274 in 2 Years

NUMBER of foundries in operation in the United States and Canada increased by 274, or approximately 5 per cent, during the past two years, data compiled for the 1945-46 edition of *Penton's Foundry List*, published by the Penton Publishing Co., Cleveland, show. Number of active foundries in the United States is reported at 5048, compared with 4802 in 1943. The Canadian total is reported at 521 as against 493 two years ago.

Since 1943, capacity of the U. S. foundry industry for producing ferrous castings has expanded considerably more than is indicated by the gain in number of foundries. Not only have many of the newly constructed plants been large ones but numerous older foundries have been enlarged or modernized. By actual count, total gray iron producers declined from 2890 in 1943 to 2879 this year; 383 foundries are producing steel castings, compared with 335 in 1943, and the number of malleable producers has increased to 139 from 126 two years ago. Without making allowance for the fact some ferrous foundries make more than one type of casting, this means there are 3401 sources of ferrous castings, an increase of 50, or about 1.5 per cent, since 1943. In Canada, the increase was from 392 to 408, or 4 per cent.

Numerically, the nonferrous group showed a much larger growth than the ferrous industry. The tabulation lists a United States total of 3040 producers of nonferrous castings, increase of 15.5 per cent compared with the 2631 two years ago. Of the current total 1795 foundries produced nonferrous castings

(*Please turn to Page* 208)

Distribution of Foundries in the United States and Canada

	Total Foundries 1945	Total Foundries 1943	Gray Iron Foundries 1945	Gray Iron Foundries 1943	Steel Foundries 1945	Steel Foundries 1943	Malleable Foundries 1945	Malleable Foundries 1943	Total Nonferrous Foundries 1945	Total Nonferrous Foundries 1943	Exclusive Nonferrous Foundries 1945	Nonferrous Foundries Dept. of Other Shops 1945	Brass and Bronze Foundries 1945	Aluminum Foundries 1945	Magnesium Foundries 1945	Centrifugal Casting Producers 1945	Permanent Mold Casting Producers 1945	Machine Shops 1945	Pattern Shops 1945	Laboratories 1945
Alabama	86	90	78	80	6	6	3	3	27	21	5	22	18	21	1	4	7	63	69	19
Arizona	7	7	5	7	2	3	..	..	6	4	2	4	5	4	..	..	3	3	7	..
Arkansas	18	18	13	15	1	1	..	..	12	8	3	9	8	8	..	..	..	12	..	1
California	392	331	149	136	37	30	3	2	280	186	226	54	189	215	14	14	51	158	216	91
Colorado	45	39	22	20	6	4	..	1	25	18	18	7	23	20	..	2	6	22	26	9
Connecticut	133	126	51	56	4	5	7	8	91	87	69	22	75	59	..	1	7	63	69	40
Delaware	13	11	5	6	3	3	1	1	8	7	3	5	7	6	..	..	1	9	10	4
Dist. of Columbia	2	2	2	2	2	1	..	..	2	2	..	2	1	2	1	1	1	2	2	2
Florida	35	33	22	24	2	1	1	..	26	28	7	19	30	27	..	..	2	27	30	5
Georgia	76	70	64	61	5	3	..	..	44	34	9	35	32	32	..	1	3	47	62	6
Idaho	5	6	5	5	..	1	..	..	4	5	..	4	4	3	..	..	..	4	4	..
Illinois	392	373	194	204	25	25	20	18	220	185	169	51	162	166	11	11	25	188	236	125
Indiana	220	210	130	126	14	12	9	10	120	106	73	47	85	94	5	9	10	102	129	65
Iowa	89	80	65	59	5	5	1	2	42	37	15	27	32	40	..	1	2	44	58	29
Kansas	48	49	39	41	1	1	1	..	27	25	8	19	19	23	..	1	2	31	40	11
Kentucky	37	36	26	24	1	..	..	..	23	19	10	13	22	13	1	1	2	22	25	6
Louisiana	35	33	24	24	5	5	..	..	22	25	8	14	21	13	..	1	2	21	25	6
Maine	24	24	21	22	..	..	1	..	16	15	2	14	14	12	..	..	..	14	20	2
Maryland	46	44	30	31	4	..	..	1	30	25	14	16	27	21	1	3	1	29	28	10
Massachusetts	216	207	104	114	11	8	3	3	144	133	100	44	133	105	3	7	9	81	120	47
Michigan	355	336	180	176	26	23	12	10	226	193	155	71	166	152	15	27	35	167	200	133
Minnesota	105	100	75	73	3	3	1	1	54	45	26	28	47	45	1	2	7	55	64	25
Mississippi	13	13	12	12	1	1	..	..	8	10	..	8	7	5	..	..	1	9	9	2
Missouri	106	104	55	59	10	12	2	1	58	50	43	15	45	50	1	4	7	56	66	31
Montana	8	8	8	8	..	..	..	..	6	6	..	6	6	1	..	..	1	7	7	..
Nebraska	23	19	14	14	2	1	1	..	18	13	7	11	16	15	..	1	..	17	15	2
Nevada	3	3	3	3	1	..	..	..	3	3	..	3	3	..	..	..	..	1	2	1
New Hampshire	22	23	13	15	2	2	2	1	16	16	7	9	16	12	..	2	1	15	15	2
New Jersey	187	172	83	81	13	7	2	2	123	104	90	33	97	85	7	9	9	90	115	44
New Mexico	1	1	1	1	..	..	..	..	1	1	..	1	1	..	..	..	..	1	1	..
New York	408	398	194	203	26	22	13	14	286	249	183	103	227	222	7	22	27	224	276	106
North Carolina	60	65	54	60	1	..	..	..	29	34	4	25	23	25	..	..	3	38	46	3
North Dakota	4	4	3	3	..	..	..	..	3	3	1	2	3	2	..	..	..	3	3	..
Ohio	522	503	279	279	36	34	21	17	288	266	202	86	210	213	13	21	39	264	330	177
Oklahoma	35	40	25	28	2	1	..	..	22	21	9	13	15	18	..	..	..	24	27	3
Oregon	55	50	36	35	10	6	..	..	29	24	9	20	25	17	..	..	2	26	36	15
Pennsylvania	532	519	327	328	60	61	17	16	300	258	149	151	246	192	2	20	27	323	388	156
Rhode Island	40	38	19	18	1	..	3	2	27	24	19	8	26	21	..	2	1	13	26	7
South Carolina	24	21	21	20	..	..	..	..	18	16	2	16	16	14	..	..	..	18	19	4
South Dakota	2	3	2	3	..	..	..	..	1	2	..	1	1	..	..	..	..	1	1	..
Tennessee	73	72	64	63	1	1	..	..	32	30	8	24	24	19	1	..	2	49	56	15
Texas	113	108	69	69	11	10	1	..	72	60	28	44	59	50	1	5	2	59	76	28
Utah	20	18	17	14	1	1	..	..	12	10	3	9	10	10	..	..	1	11	13	6
Vermont	18	16	15	14	..	..	1	..	6	5	2	4	5	5	..	..	2	13	11	3
Virginia	69	68	62	64	4	2	..	..	44	42	4	40	40	29	..	3	5	48	48	12
Washington	90	85	51	49	19	18	1	1	60	53	30	30	54	43	1	..	5	32	55	22
West Virginia	38	38	24	26	2	2	1	1	24	24	9	15	23	11	..	1	6	25	30	8
Wisconsin	201	186	123	114	16	14	11	11	103	98	63	40	85	80	3	11	19	96	120	68
Wyoming	2	2	1	1	1	..	..	..	2	1	1	1	2	..	..	..	..	2	1	1
Total	5048	4802	2879	2890	383	335	139	126	3040	2631	1795	1245	2329	2210	89	187	336	2629	3232	1348
Alberta	15	12	12	10	1	1	..	..	14	10	3	11	11	10	..	1	3	13	14	4
British Columbia	58	55	44	41	9	8	1	1	44	39	14	30	40	29	1	1	3	30	48	13
Manitoba	19	17	14	10	3	2	..	..	13	8	4	9	8	12	..	..	..	12	17	5
New Brunswick	11	9	9	8	..	..	..	..	9	6	1	8	8	7	..	..	1	7	10	1
Newfoundland	4	5	4	4	1	1	..	..	4	4	..	4	3	4	..	..	..	2	4	2
Nova Scotia	24	23	21	21	2	2	..	1	15	16	1	14	15	8	..	..	2	16	19	2
Ontario	260	255	169	174	9	9	13	11	174	134	78	96	132	136	1	10	14	173	201	59
Prince Edward Island	3	4	3	3	..	..	..	..	2	2	..	2	2	1	..	..	..	2	2	..
Quebec	119	106	72	66	11	11	3	2	78	56	31	47	71	70	1	8	12	74	87	33
Saskatchewan	8	7	7	6	..	..	..	..	5	3	..	5	5	4	..	..	..	6	7	..
Total	521	493	355	343	36	34	17	15	358	278	132	226	295	281	3	20	35	335	409	119
Total U. S. and Canada	5569	5295	3234	3233	419	369	156	141	3398	2909	1927	1471	2624	2491	92	207	371	2964	3641	1467

Sharp Cut Seen In U. S. Postwar Budget, Taxes

Senator George says budget should be tailored to federal revenues. Sees possible tax reduction of $18 billion

SHARP reduction in taxes on business and a federal budget of between $22 and $25 billion—about one quarter of the wartime budget—are envisaged by Sen. Walter F. George (Dem., Ga.), chairman of the Senate Finance Committee.

Senator George pictured the possibility of a reduction in taxes amounting to $18 billion a year after the defeat of Japan.

A postwar tax program should be formulated now and either adopted or held in readiness for enactment, Senator George told a news conference. "It is very essential that all taxpayers know what their burdens are going to be," he said.

The senator's advocacy of prompt action is in line with the thinking of other administration spokesmen. Although opposed to any general reduction in taxes before V-J Day, the national administration favors early revision of the tax structure for use when victory comes. Secretary of the Treasury Fred M. Vinson recently told Congress: "There is an important benefit to early adoption of a postwar tax program. The sooner the uncertainties in the postwar tax structure are removed the sooner business . . . will make commitments . . . and the faster men can be put to work."

Taxpayers' Ability To Pay

Senator George recommended that the postwar budget should be based on the taxpayers' ability to pay rather than upon the desire of the government to spend.

"It is putting the cart before the horse to fix a budget first and then draw up a tax program. We first must find out what the taxpayer can stand and fix the budget accordingly."

Senator George believes the $22 to $25 billion annual spending rate will continue for a year or two after the war. After that the amount will depend on changing conditions and various factors which now are incalculable.

He sets as an "irreducible minimum" of government spending of $14 to $16 billion a year to meet such commitments as interest on the public debt, payments to veterans, administrative costs and maintenance of the necessary armed forces. Some spending on top of this amount will be necessary, he said, adding that legislative and executive branches could run the outlay much higher.

A revised federal budget for the 1946 fiscal year calls for total expenditures of $85 billion, compared with about $100 billion in the 1945 fiscal year. This is based on the assumption the Japanese war will continue into next year. Receipts for the 1946 fiscal year are expected to drop from $46.5 billion to $39 billion, as a result of lowered spending for military purposes.

Sen. Walter F. George, chairman, Senate Finance Committee, tells newsmen postwar federal spending and taxes must be reduced drastically. NEA photo

TRANSITION TOPICS

BRITISH ELECTION— Labor's victory interpreted as swing to left. New government committed to nationalization of basic industries, including iron and steel. See page 83.

PRICES— OPA makes compensatory adjustment in cold-finished carbon steel bar prices, granting increase in base prices while ordering decreases in extra allowances. See page 86.

TAXES— Senate Finance Committee chairman says postwar budget should be tailored to ability to pay. Sees sharp reductions in spending and taxes. See page 91.

RECONVERSION— Failure of government to provide adequately for resumption of civilian manufacturing criticized by Senate War Investigating Committee. See page 96.

AUTOMOBILES— United States Steel chairman believes auto manufacturers will obtain enough steel to fill 1945 quotas. Kaiser-Frazer combine arouses much interest. Los Angeles considered likely site for West Coast plant. See pages 88, 99.

ARC WELDING ELECTRODES— Revision of AWS and ASTM specifications for arc welding electrodes simplifies selection of these welding "tools" and points toward increased use after the war. See page 112.

INFRA-RED LAMP EQUIPMENT— Important advantages offered by infra-red installations for heating, drying and baking indicate many postwar applications. See page 118.

COLLECTING OIL MISTS— Mists resulting from break-up of cutting oil now may be precipitated electrostatically, eliminating unpleasant working conditions and reducing hazards. See page 120.

Tool Disposal Regulations Under Study by Surplus Property Board

Seeks answers to critics of sales policies. Complaints include failure to offer many modern machines though considerable equipment in this classification is idle. Only 20 per cent of tools available are readily salable types

OFFICIALS of the Surplus Property Board of late have been devoting considerable thought to current criticism of the board's regulations governing the sale of government-owned machine tools and other property. While these regulations have been drawn to insure property disposal in accordance with the provisions of the Surplus Property Act, the board does have considerable latitude and it is the desire of Administrator Alfred E. House and associates to lay down policies, as far as possible, that will meet with approval.

One of the principal complaints is that offerings by the Reconstruction Finance Corp. have included comparatively few general-purpose machine tools and other equipment, and comparatively few tools built in the last five years. Many tools, it has been pointed out, now are idle as a result of terminations, and the question has been raised by potential buyers, and in business paper editorials, whether many of these tools might not now be relinquished by the Army and Navy, the principal government owning agencies, for use by industry in reconverting to civilian production.

The SPB goes along with this thinking to the extent that idle government-owned equipment should be used to expand production of civilian goods, and provide peacetime employment with the least delay possible. But it has no practicable legal power to influence the Army and Navy in declaring equipment to be surplus; furthermore SPB officials cannot advise the Army and Navy as to whether or not there will be future war work for equipment which now is idle. Hence the SPB is unable to take any action that would increase current offerings of industrial equipment.

SPB officials can, and do, insure the widest publicity for such equipment as is currently available for sale. As a result, the RFC is about to step up its advertising campaign and other sales promotional activities. It will circularize potential buyers more intensively to acquaint them with the equipment available for sale. RFC also is continuing work on the preparation of a central inventory to list tools which currently are in the custody of its regional offices. It is hoped that with such a central inventory, which should be ready for use within a few weeks, the problem of advertising surplus equipment, and circularizing potential buyers, can be handled more effectively.

A check recently made by the RFC reveals ample justification for the complaint that it has few standard general-purpose tools of modern design on sale. This check revealed that only about 20 per cent of the surplus tools it now has available for sale are of readily salable types. Of about 20,000 tools in the hands of the RFC as of June 30, only about 4000 were standard general-purpose tools of fairly modern design, while the remaining 16,000 comprised single-purpose or over-age tools for which it was difficult to find buyers. The check revealed further that standard general-purpose tools are snapped up as fast as they are offered.

Another widely circulated criticism which has had the attention of SPB officials is that terminated contractors enjoy undue advantages in acquiring desirable tools and other equipment under regulation 9. This is the regulation which instructs owning agencies like the Army and Navy with respect to disposition of equipment and materials involved in termination and pretermination settlements. Under regulation 9, the Clayton formula of cost less depreciation does not apply; rather, prices are arrived at by negotiation. The regulation requires that the owning agency determine the fair price by testing the market. This may be done by advertising for competitive bids, by appraisal, or otherwise.

SPB officials admit that the terminated contractor does have some advantage under regulation 9. He frequently can get a concession in price. For instance, the owning agency may find that it might cost $200 to package, move and store a $1000 machine in order to make it available to other buyers; in such cases the owning agency might be willing to let the contractor have the tool at $800.

Concession Are Justified

Concessions of this kind, SPB officials feel, are in the interest of taxpayers and are in accord with the wishes of Congress in writing the Surplus Property Act. When a tool is moved out of a plant there is bound to be a delay of several months before that tool could be put to a new use. On the other hand, the chances are that if it is left in the contractor's plant it will be used promptly and thus provide employment. It is worth something to the taxpayer, the SPB reasons, to lower the price of a $1000 tool to $800 when such action promotes new production and employment.

However, regulation 9 contains a number of provisions to guard against windfalls to the contractor during termination settlement. Generally, sales prices must be at market levels or must be fair and reasonable and must not be less than 50 per cent of cost. The regulation assumes that the contractor will retain property for use, but the owning agency may authorize

CHARTER RATIFIED: Shown examining a copy of the world security charter after it had been ratified by the Senate by an 89-2 vote are, left to right: Sen. Arthur H. Vandenberg (Rep., Mich.); E. R. Stettinius Jr., chairman, American delegation to the world security conference; Sen. Tom Connally (Dem., Tex.); Sen. Alben Barkley (Dem., Ky.); Sen. Kenneth McKellar (Dem., Tex.), president pro tem of the Senate. NEA photo

What does it take to make a war?

It takes more than a toothbrush mustache, an upraised arm, a symbol on a flag.

And it takes more than guns and tanks and planes.

It takes ignorance, intolerance and want. . . . The psychopathic mire that breeds little conquerors, and the political softness that makes nations look the other way.

But what does it take to *prevent* a war?

It takes knowledge, communication, and freedom of thought. . . . Economic opportunity, and productive power.

And it takes a strong police force to keep the rough neighbors kids in line and slap the gangsters down.

America lacked what it takes to *make* a war. But we have what it takes to win one . . . and to *prevent* one in the future. Today, the engineers of the basic machine tool producers stand ready to help the men of government and of industry in their postwar planning for a strong America — a nation powerful enough to prevent future wars with the strength of a healthy economy here at home, and the best equipped military police force the world has ever seen.

BRYANT CHUCKING GRINDER COMPANY SPRINGFIELD VERMONT, U.S.A.

him to sell surplus goods out of his inventory subject to certain stipulations aimed at insuring a fair deal to his customers, and preventing him from making an undue profit; also, competitive bids are required in cases where the goods are to be resold. The regulation provides that a sale of goods costing more than $25,000 cannot be made without advertising to develop values.

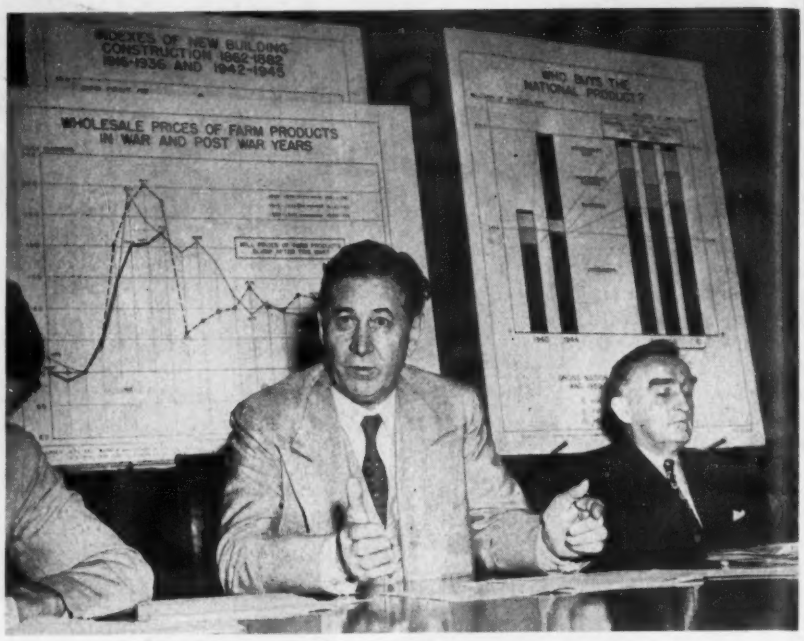
Regulation 9 also is believed to prevent utilization, except as scrap, of any tool bought by the terminated contractor at a scrap price. It defines the categories of scrap and salvage and prescribes that such property must be sold at competitive bids, also, the buyer paying less than 50 per cent of the cost of the property must give a warranty that it will be used as scrap only. A further protection is that nothing costing more than $300 can be declared scrap without review at a higher level in the owning agency. The net result of these protections, SPB officials believe, is to prevent a contractor from obtaining a usable tool at a scrap price.

The general philosophy of preventing windfalls to terminated contractors in negotiating either pretermination or final settlements also has been applied by the SPB in cases involving "hard-to-move" equipment. Often materials handling, processing and other equipment is so built into the plant that it could be removed only at considerable expense. In such instances a contractor is not allowed to buy the equipment at a fraction of its value just because the government would have to go to a lot of expense in tearing it out. Regulation 9 provides that in such cases the owning agencies are to go to whatever expense is necessary in order to prevent violation of the ban against sales of usable property at less than 50 per cent of the cost.

RFC Sales Practice Approved

Up to the present time SPB officials have not seen any necessity for amending the sales practice of the RFC in answer to complaints that the method of pricing under the Clayton formula, or of setting prices by appraisal, fails to give adequate encouragement to dealers who rebuild these tools and sell them with new tool guarantees. A check shows that approximately 50 per cent of the tools sold by the RFC so far have been made to companies that buy them for resale in a rebuilt condition. That is because many of the tools offered by the RFC are overage; most of the tools bought by the rebuilders were built prior to 1936. If any more liberal treatment is to be provided for the rebuilders it probably will be reserved until such time as tools of more recent vintage are offered in larger volume and the need for servicing by the rebuilders becomes more apparent.

As to demands by rebuilders that they be permitted to buy government-owned tools now in Europe and bring them back for rebuilding and sale to domestic industries, SPB officials rule that tools which may become surplus out of the country must not be brought back. There will be plenty of tools for everybody, they believe, without such action, and the reimportation of these tools would add to marketing difficulties.


INDEXES OF NEW BUILDING CONSTRUCTION 1862-1882 1915-1936 AND 1942-1945
WHOLESALE PRICES OF FARM PRODUCTS IN WAR AND POST WAR YEARS
WHO GETS THE NATIONAL PRODUCT?

CITE BRITISH VOTE: Sponsors of the full employment bill in testifying before the Senate Banking and Currency Committee cited labor's sweep in the British election as an indication the United States must guarantee employment to prevent serious social upheavals. Here, Sen. James E. Murray (Dem., Mont.), tells the committee America must provide a program to insure employment for all willing and able to work. At right is Sen. Joseph C. O'Mahoney (Dem., Wyo.), also a sponsor of full employment. NEA photo

SPB officials have not yet seen the advisability of accepting suggestions that surplus machine tools be turned back to their original manufacturers who would act as sales agents for the RFC. Proposals for such an arrangement have envisioned that the manufacturers would be asked to sell in the ratio of, say, one surplus tool to two newly-produced tools—thus preventing sharp drops in employment at plants making machine tools and related equipment.

Recently the SPB adopted a resolution under which it can take appropriate action should its investigation of complaints brought to its attention reveal that sales of government-owned tools in special instances may be counter to the interests of taxpayers or may favor the larger buyers at the expense of buyers in general. Under this resolution it is prepared to direct that no more government-owned machinery can be sold to an individual company when that company is found to have come into possession of more equipment, either through purchase of tools offered as surplus, or through purchase of tools in terminated inventories, than it should reasonably have.

Dissatisfaction with the inventory control system of the Reconstruction Finance Corp. in listing surplus machine tools and production equipment again has been expressed by Senator Tom Stewart (Dem., Tenn.) in further hearings of the Senate Small Business Surplus Property Committee of which he is chairman.

During the initial hearings in April Senator Stewart requested RFC to prepare a central inventory to show the tools held by it in its regional areas throughout the country. When Walter E. Joyce, assistant director of the RFC Office of Surplus Property, last week submitted his list, Senator Stewart characterized it as merely an information sheet lacking the detail which a buyer needs in order to locate a machine of given type and size to meet his requirements.

Under spirited questioning, Mr. Joyce admitted that the list which he had produced was not one from which a customer could make a direct selection but he insisted it was an effective means of locating the machine desired by the customer. For example the list submitted by Mr. Joyce showed that RFC has 17 types of drilling machines on hand and that it has a total of 2675 drilling machines of these 17 types in its regions.

"When RFC gets an inquiry for a drilling machine of a particular type and size," said Mr. Joyce, "it is a simple matter to send a teletypewritten inquiry to

each of the regional offices reporting drilling machines in stock. By that means, we can within a couple of hours locate any machine we have in stock."

To maintain a central, complete inventory, Mr. Joyce said, it would be necessary for RFC to enlarge its staff of trained clerks and these people are hard to find. When he referred to the extra expense such an effort would entail, Senator Stewart objected vigorously.

"Why we should balk at spending a few millions to build up an effective system for selling property that cost the taxpayers $18 billion is more than I can fathom," he declared.

Opinion of several spokesmen about the value of a central inventory was divided. Charleton MacVeigh, deputy director of the Army's Readjustment Division, thought a list purporting to be a complete inventory of tools on hand would be misleading in a number of respects. It would necessarily include many tools sold even while the list was being assembled. It would have to indicate which surplus tools, by action of the War Production Board, cannot be generally offered because they are in "short supply" — and Mr. MacVeigh pointed out that some tools will be removed from the "short supply" category and others added as war needs change. He also foresaw some difficulties from the fact that a complete list would have to show all tools available for sale whether or not they had been declared surplus.

Regulation 6 Criticized

Mr. MacVeigh brought up a point which previously has aroused considerable question; namely, that regulation 6 of the Surplus Property Board permits the sale of production equipment to "contractors in possession while the tools still are engaged in war production and before the tools have been declared surplus by the owning agency and thus made available to buyers in general. This point was not debated at length at the hearings but undoubtedly will come up for later investigation, for there have been at least two objections to regulation 6. The first is that it covers the sale of equipment prior to its being declared surplus, and the other is that the contractor in possession—usually regarded in Congress as a "big interest"—is able to buy equipment on a favorable basis at a time when other potential users—usually placed in the category of "small business"—are unable to get a chance at it.

W. Stuart Symington, the new chairman of the Surplus Property Board, lined up with Senator Stewart in believing maintenance of a complete central inventory is necessary. "You are not going to be happy unless you get such an inventory, and without such an inventory the small buyer is definitely handicapped," Mr. Symington told the senator. It should be easy to set up such a list, he said. Every plant has a list of government-owned equipment therein and contractors or government representatives operating those plants can send a copy of the list to Washington where, said Mr. Symington, it could be assembled into useful form by a group of no more than ten people.

Matthew H. Wells, assistant director of the Smaller War Plants Corp. Surplus Property Division, also supported Senator Stewart. "As an old machine tool man," he said, "I feel that there ought to be a complete inventory at a central point. The present list does have some value in that it indicates the regional offices of RFC that may have a machine of desired type and size. But it does not go far enough," said Mr. Wells. "It is not sufficient to list all grinding machines in one group; there are 25 to 30 different types of grinding machines and they should all be shown."

Barnett Watson, of the Smaller War Plants Corp. legal staff, informed the subcommittee that the SWPC about Aug. 15 will canvass some 30,000 small manufacturers throughout the nation to ascertain what machine tools and items of production equipment they need presently, including what they will need during the reconversion period. This canvass, it is hoped, will make it possible to define the "small business" market for surplus government-owned equipment.

E. Richard Bagarozy, president, Pressurelube Inc., New York, testified that his company took a contract from the National Tube Co. on Navy work but, not being able to get two suitable automatic screw machines, was forced to subcontract about 90 per cent of the job—and this entailed some financial loss. Navy and RFC men on whom he called for assistance were unable to locate the machines. Thereupon Scott R. Gray, the subcommittee's counsel, introduced an RFC list of surplus equipment available for sale at a plant operated by the Delco-Remy Division, General Motors Corp. at the time Mr. Bagarozy wanted two screw machines. The latter identified two of the machines on this list as being just what he wanted.

The subcommittee proposes to send out investigators over the next couple of months to study all details of the present setup for disposing of surplus property. After their findings become available Senator Stewart expects to amplify a recently-introduced Senate resolution aimed at improving the present Surplus Property Act.

Patent Ownership Spread Widely Over United States

Ownership of patents is scattered widely over the United States, a survey of patents issued in the second quarter of 1945 indicates.

Announcing results of the survey, R. J. Dearborn, chairman of the patents committeee, National Association of Manufacturers, New York, pointed out that every state was represented in the 6253 U. S. patents issued to Americans between April 3 and June 26.

States receiving most patents were New York, Illinois, New Jersey, Ohio, California, and Michigan, in that order. On a per capita basis the highest ranking states were Delaware, New Jersey, Connecticut, Michigan, and Illinois, in that order.

Bill Proposes Congressional Sanction For All New Government Corporations

A BILL requiring that all corporations established to act as agencies or instruments must be established by an act of Congress or pursuant to such an act has been introduced in the House by the Committee to Investigate Expenditures in the Executive Departments.

Bill further provides that after June 30, 1948, there should be an end to all wholly-owned government corporations created under the laws of any state, territory or possession of the United States unless they obtain congressional authority to incorporate under federal charter.

The bill, H. R. 3660, would effect some reforms, stipulating that a business-type budget for wholly-owned government corporations be incorporated as part of the annual federal budget. It would require for all government-owned corporations a commercial-type audit by the General Accounting Office and a report to Congress. The bill also, with certain exceptions, would provide for overall Treasury control of the depositories, financing and government security transactions of all corporations.

The government has gone into business to an unjustified extent, the committee said in reporting its bill to the House. It said that 101 separate government corporations are engaged in various fields of production, transportation, generation of power, loans, housing, insurance and other lines of business. As of Mar. 31, they had gross assets of $29.6 billion, gross liabilities of $28.4 billion and net worth of $1.2 billion.

Of the gross assets, the major items, after deducting reserves for valuation and estimated losses, were $13.3 billion in loans receivable; $7.8 billion in land, structures and equipment; $2.9 billion in commodities, supplies and materials; $2.1 billion in investments; and $1.6 billion in other receivables. Of the gross liabilities, $22 billion were in bonds, notes and debentures.

Senate Group Criticizes Plans For Transition

Says U. S. unprepared to overcome postwar domestic problems. WPB claims good progress being made

FAILURE of the government to plan properly for reconversion was charged last week by the Senate War Investigating Committee in its fourth annual report. An early end to the Pacific war, it warned, would "find us largely unprepared to overcome domestic problems. . . . Government work programs will not have been established. Unemployment on a large scale will ensue."

Although the committee concluded that reconversion "has not proceeded as swiftly as it should" since the end of the European war, this view is not held by the War Production Board. This agency said recently that American industry has made "excellent" progress toward reconversion while maintaining the high rate of production of goods required by the armed services.

WPB pointed out in its report that reconversion cannot go faster than resources of materials and manpower are released from war production. Industry has been aided in solving its reconversion problems by WPB's relaxation or cancellation of orders controlling the manufacture and distribution of many civilian products, open-ending the Controlled Materials Plan, and granting assistance to industry in obtaining tools and equipment or for construction necessary to reconversion.

WPB has issued a new regulation, priorities regulation 30, which requires application be made for a new "military" MM rating percentage not later than Aug. 15. New ratings will be based on July shipments. The "rating percentage" will indicate the proportion of their orders for production materials that manufacturers may rate as MM.

Those manufacturers who are most resourceful in seeking out idle and excess stocks, or in substituting materials that are in easy supply, such as aluminum sheet, for those that are in tight supply, such as light gage steel sheet, are the ones who are making the most rapid progress in reconverting to civilian production, WPB said. For instance, substitutions of aluminum corrugated sheet for galvanized steel sheet have been proposed for many types of Army and Navy shelters.

Procedure for getting priorities assistance on equipment needed for initiation, resumption or expansion of civilian production or services has been simplified.

NEW REFRIGERATORS: Frigidaire Division of General Motors Corp. in Dayton, O., produces the first of 50,000 household refrigerators authorized for manufacture. The first box is shown here being christened by Shirley Kreuger, 10-year-old daughter of the plant superintendent, and E. R. Godfrey, general manager. NEA photo

The filing of a single application (WPB form 541-A) to cover any number of items of equipment needed for the same civilian purpose is now permitted under priorities regulation No. 24, as amended.

Applications for equipment for war production or for production or services that are essential to the war effort must be filed under the customary procedures and not under the new civilian-production or services regulation.

Office of Price Administration and Office of Economic Stabilization anpounced recently a plan that will clear the decks for speedier handling of reconversion pricing problems. The plan sets up a procedure for removal of controls in less important fields, enabling OPA to give more effective attention in the task of setting prices for civilian goods coming back into production.

Price Administrator Chester Bowles is authorized now to suspend price control for specific items, or exempt them from price control entirely under stated conditions. Plans to lift the ceiling on some items, however, does not mean that suspension or termination of controls on major items in the American economy is contemplated, Mr. Bowles said.

Reconverting manufacturers have been given "profit factors" by OPA for use in working out rapid individual adjustments in ceiling prices of civilian products they are once more beginning to produce. Factors have been provided for 15 specified industries and for 7 industry groups, covering all unspecified industries covered by the three reconversion pricing orders issued July 19 (STEEL, July 30, p. 60.).

The profit factors equal one-half of the average percentage margin of profit over total cost for the industry or industry group in the period of 1936-1939. In the case of the small firms, these profit factors are to be used only when they are higher than the firm's own pre-war margin over cost.

By using these factors, in combination with adjustments for increases in materials prices and basic wage rates, individual reconverting firms may obtain, under these orders, price relief over and above prices established after industry-wide reviews of existing ceiling prices of reconversion products.

The industries, industry groups, and profit factors in per cent are:

Specified Industries: Aluminum cooking utensils (sheets), 6.2; aluminum cooking utensils (cast), 2.3; bicycles, 3.8; clocks and watches, 5.5; coin-operated machines, 2.4; household scales, 4.1; lighting fixtures, 2.6; metal caskets, 1.6; metal office furniture, 5.4; metal toys, 5.1; musical instruments, except pianos and organs, 3.1; office and store machines, 8.9; photographic accessories and equipment, 8.1; radios and phonographs, 3.0; safes and vaults, 3.9; small firearms, 4.7; wood and upholstered furniture, 1.6.

Industry Groups: Beds, mattresses, etc., 3.2; small electrical appliances, 4.9; sporting goods, 3.1; miscellaneous nonferrous metal products, 5.2; other miscellaneous durable products, 3.6; other wood products, 3.6.

Use of the factors is not mandatory in the case of manufacturers who do an annual business not in excess of $200,000.

These smaller manufacturers may take instead their own average profit margin during the years 1936-1939, and very small manufacturers (under $50,000 a year) may take their own margin for the first of the years 1939, 1940, and 1941 for which they have profit data.

Reconversion Credit Aids For Small Business Urged

The period of reconversion, at best, will be a trying one and Congress should take action to insure that credit will be available wherever needed, Leo T. Crowley, in his capacity as chairman of the Federal Deposit Insurance Corp., has advised the House Committee on Small Business.

"However, in our enthusiasm to aid small business we should not make the mistake of advocating policies which will encourage business firms to assume debts which they cannot service.

"The best way to aid in the financing of small business is to ameliorate certain basic economic problems. If small business is properly protected by the antitrust laws and by enforcement of fair trade practices, if taxation is fair and proper, and if the necessary steps are taken to avoid major depressions, small business will have such good prospects that it will have little difficulty in being financed."

In some respects, says Mr. Crowley, the small business has exceptional advantages for financing itself. Its financing on a relatively direct and personal basis avoids most of the high cost and overhead which may be incident to the financing of large business, he says.

"The primary role of the federal government," says Mr. Crowley, "is not directly in the financing of small business but rather in helping to provide the fundamental conditions for confidence. One of the chief contributions the government can make in this connection is to avoid giving advantages to big business.

"All this does not mean that there may never be a need for the government to take positive action. In the depression of the 1930s government loans to business were most appropriate. If depression again comes to us, the Congress should provide for such financing when and if necessity demands . . . . Harm rather than good would result from extension of government activity in this field at present.

"If depression does occur and government support of the financing of business becomes necessary that support should take the form of direct loans rather than government guarantee of loans," declared Mr. Crowley, thus placing himself squarely on record as opposed to the loan insurance program advocated by Maury Maverick of the Smaller War Plants Corp. Insurance of bank credits would encourage unsound banking methods, said Mr. Crowley.

PRIORITIES–ALLOCATIONS–PRICES

Summaries of revocations of and amendments to orders and regulations; official interpretations and directives, issued by War Production Board and Office of Price Administration

REVOCATIONS

MOLYBDENUM PRODUCTS: Order M-369, which established allocation control over molybdenum products, has been revoked. (M-369)

TUNGSTEN: Order M-369-a, which established allocation control with exceptions over tungsten and which restricted use of tungsten rod for contacts, has been revoked. (M-369-a)

CMP REGULATIONS

CLASS B PRODUCTS: A manufacturer who wants to produce a class B product under CMP need not file an application on form CMP-4B for an allotment of controlled materials or an authorized production schedule for the product. He may obtain his material without use of ratings or allotments or by extending his customers' ratings to get uncontrolled materials. (CMP-1)

ORDER SCHEDULING: A controlled materials producer who is able to produce and deliver an order in advance of the time permitted by WPB regulations may reschedule for an earlier date, provided he gets agreement from his customer, if it is an authorized controlled material order and the earlier date is within the same quarter for which the order was originally scheduled. (CMP-1)

ALUMINUM: The 60-day restriction on inventories of aluminum has been changed to 90 days for all forms and shapes of the metal, except foil and extrusions. These inventory resrtictions, as well as those contained in PR-1, do not apply to aluminum where the user's total inventory of all shapes and forms of it, except extrusions and foil, in any operating unit, does not exceed 100 000 pounds. A person is permitted to receive in anticipation of starting or resuming civilian production the maximum amount of aluminum, except extrusions and foil, he would need during the first 90 days of such production. (CMP-2)

CONTRACTORS' INVENTORIES: Prime contractors and subcontractors are now permitted to continue to accept "special" items when a war contract is severely cut back, but not terminated. If the customer is unable to reschedule deliveries so as to bring his inventory down to the limits required by CMP regulation No. 2 and priorities regulation No. 1 within six months, he may continue to accept delivery of the special items, provided deliveries are rescheduled at the lowest practicable rate and have been approved in writing to the customer by the procuring agency. (CMP-2, PR-1)

COPPER WIRE: Amount of copper wire that repairmen may buy in a quarter without WPB authorization has been increased from $75 worth, or one-tenth of what they used in making repairs in the year 1941 (whichever is greater), to $150 worth, or one-eighth of 1941 repair usage. (CMP-9A)

L ORDERS

ELECTRONIC EQUIPMENT: Restrictions on the production and sale of parts required for the manufacture and repair of electronic equipment have been removed. Restrictions were also removed from the sale of electronic equipment when produced under WPB authorization.

Procedures for applying for permission to make electronic equipment and for requesting permission for a producer to use idle and excess inventories that he may have on hand for civilan production have been simplified by WPB. (L-265)

MOTORCYCLES: Motorcycles with a piston displacement of less than 50 inches have been removed from distribution control. (L-331)

M ORDERS

IRON AND STEEL: Processors must file a report of estimated monthly production of tungsten and molybdenum wire with the Ferroalloys Branch, Steel Division, WPB. (M-21)

PRIORITIES REGULATIONS

ORDER CUTBACKS: Rules to be followed by manufacturers who received priorities assistance or an authorization for machine tools or other facilities for a military contract that has been canceled or cut back are set forth in direction 9 to priorities regulation 1. Procedures are established for machine tools or equipment orders that have not been placed, and also where orders already have been placed. (PR-1)

CIVILIAN PRODUCTION: Procedure for obtaining priorities assistance on equipment needed for the initiation, resumption or expansion of civilian production or services has been simplified. Filing of a single application to cover any number of items of equipment needed for the same civilian purpose is now permitted. The only exceptions are a few listed types of equipment such as some chemical processing or laboratory equipment and other items, for which the appropriate WPB form must also be filed. Applications for priorities assistance on equipment for war production or for production or services that are essential to the war effort must be filed under the customary procedures and not under the new civilian-production or services regulations. (PR-24)

PRICE REGULATIONS

IRON AND STEEL: Base price for cold-finished carbon bars has been increased $2 a net ton. Extras have been decreased $2 a net ton for physical inspection and testing and $6 a net ton for strain and stress relieving. Producers must file quarterly financial and production reports. (No. 6)

COPPER ALLOY SCRAP: Sellers of copper alloy scrap may add a special-use premium of 1.25 cents a pound to base maximum prices when the scrap is prepared to meet the specifications of certain qualified consumers and is sold suitable for their direct use without further preparation. (No. 20)

STEEL WAREHOUSES: Distributors may increase their maximum prices for cold-finished carbon steel bars $2 a net ton. (No. 49)

FERROSILICON: Sellers of silicon metal or ferrosilicon of grades different from those for which specific maximum prices are provided may submit proposed prices for the items to OPA for approval. (No. 405)

AIRCRAFT: Price control of airplanes and most airplane parts was suspended, effective July 18. The exceptions that will remain under price control include: Die castings nonferrous castings, and iron and steel castings. (GMPR)

Appointments-Resignations

M. J. Madigan, assistant to Robert P. Patterson, Under Secretary of War, has been appointed a member of the Aircraft Production Board, WPB. He replaces Lt. Gen. William S. Knudsen who has returned to civilian life.

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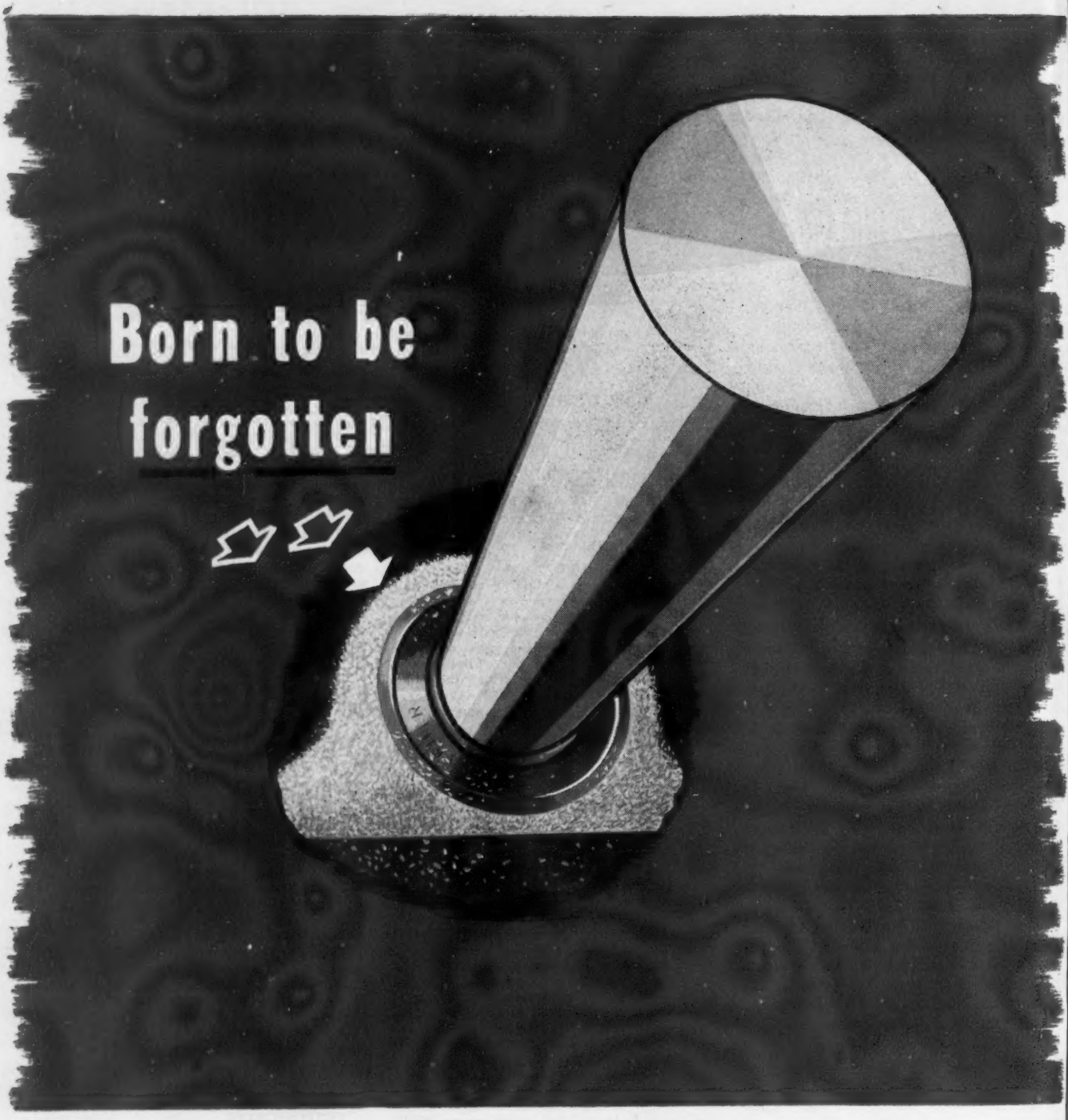
Lee Moran has resigned as head of the Automotive Division, Office of Surplus Property, Department of Commerce.



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FAFNIR BALL BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

MIRRORS of MOTORDOM

Organization of Kaiser-Graham Corp. marks interesting chapter in automotive history. Name of Graham likely to disappear as hundreds of others have done. Los Angeles considered probable site for plant to manufacture new Kaiser cars

ORGANIZATION of the Kaiser-Frazer Corp., with announced capitalization of $5 million and its intent to embark on the production and sale of two new passenger cars, the Kaiser and the Frazer, possibly by next spring, is the latest chapter in the career of Joseph Washington Frazer.

Associated with Walter P. Chrysler in the early days of the development of the Maxwell, he was later vice president in charge of sales for the Chrysler Division of the Chrysler Corp. for 15 years, leaving his post there in 1939 to take over the presidency of Willys-Overland. He remained there four years, building up around him a production and administrative organization, most of which he took along with him when he purchased the Warren City Mfg. Co., Warren, O. At that time this company was little known, but some Navy contracts and a new building and equipment, paid for in part by the Navy and DPC, set things humming there.

Next came the deal whereby the 53-year old Frazer acquired control of the Graham-Paige operations in Detroit, bringing in the Warren company as a subsidiary. He was named chairman of the board at no salary, but acquired about 150,000 shares of Graham stock, then priced at around $3.50 or less per share. Soon thereafter Graham stock had leaped to $7 per share. Thus, on paper at least, Frazer had assets of better than a million, on an original investment reported to be meager.

Other Backers Reported

Insiders say there are other interests back of Mr. Frazer, including the Atlas Corp., an eastern investment trust whose influence has been discerned in a score or more of industrial concerns throughout the country, including steel and automotive. A week ago Floyd Odlum, president of Atlas Corp., denied Atlas was interested in the new Kaiser-Frazer Corp.

Announcement of the new company was a carefully timed affair. Newsmen were not informed of the meeting at which the announcement was made until after the stock market had closed for the day. Thus, at 3 p.m. they were telephoned and asked to be present at a meeting at 5 p.m. when an "important disclosure" would be made. They gathered in a small suite at the Book-Cadillac to be greeted by Mr. Frazer and his public relations men. Then the announcement of the Kaiser-Frazer Corp. was made, followed by Mr. Frazer getting on the long-distance telephone with Mr. Kaiser in San Francisco and saying, "Yes, Henry, the press conference is underway and they all seem quite impressed."

As everyone knew would happen, furious trading in Graham common stock developed on the day following the announcement, transactions totaling over 205,000 shares and the price going from 7⅞ to 9. It kept moving at this pace as idle money poured into the "low-priced motors," as Graham is called in market parlance. Last Tuesday, it touched $12 per share, or an increase of 52 per cent in 3½ days of trading.

Realignment of the Graham board sees the removal of R. L. Hodgson as president to make way for Mr. Frazer who now apparently is to be a salaried official. Mr. Hodgson is a former official of the RFC who went into Graham years ago after the RFC granted a large loan to the company. W. L. Eaton, for many years a Graham vice president and director, has resigned, and two new vice presidents, Vern Drum and W. A. MacDonald, both former associates of Mr. Frazer in Willys, have been named.

So the name Graham on passenger cars now appears relegated to the graveyard of hundreds of other makes which have come and gone over the years. Its successor is the Frazer, the name which also will be given to the tractor the company hopes to get into production some day. W. B. Stout, research expert for Consolidated Vultee Aircraft, continues to be a consultant for Mr. Frazer, some observers guessing this arrangement may have been sanctioned by Convair and its associates, the Aviation Corp., in exchange for Mr. Frazer agreeing to use a Lycoming engine in his car.

As for the West Coast arm of this newest automotive combine, many are convinced Mr. Kaiser has the backing of powerful financial interests including the Gianninis, Felix Kahn and a host

Contemplating the use of expanded western industrial facilities for the future manufacture of passenger cars are Henry J. Kaiser, right, and Joseph W. Frazer on catwalk of warehouse overlooking Richmond Shipyard No. 2 at Richmond, Calif. Formation of the new Kaiser-Frazer Corp. was being announced as this picture was taken. NEA photo

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F. R. HOOK

JAMES L. CONLON

Mr. Conlon has been appointed resident manager of the new General Motors plant to be operated at Columbus, O., by Ternstedt Mfg. Division, a unit of Fisher Body. A veteran of 20 years with Ternstedt, he has been manager of the Detroit plant since last February. Mr. Hook has been named resident manager of the Fisher Body stamping plant to be built at Hamilton, O. Works manager at the Columbus plant will be Paul Jones, executive assistant to the general plant superintendent of Ternstedt, and John Broden, now industrial relations director, will be general factory superintendent.

of others. His name by virtue of his glamorized ship production achievements, has a powerful appeal to the lay public, an important factor in merchandising automobiles. His association with Mr. Frazer may prove to be the solution to merchandising the automobile which he intends to build on the Coast.

Speculation concerning the West Coast location of a plant to manufacture the Kaiser automobile indicates Los Angeles as the probable site.

An important consideration is availability of raw material. If, as is probable, steel sheets are supplied by the Kaiser mill at Fontana, the source of steel will be only 50 miles from Los Angeles.

Moreover, bodies produced for the test models of the new auto have been stamped by Norris Stamping & Mfg. Co. at its plant in Los Angeles. Although no announcement has been made that Norris will be the subcontractor for bodies, it is believed that it likely will be. Norris Stamping which has grown into one of the West Coast's biggest war plants, undoubtedly will have surplus plant space after the war. Therefore it appears logical that Norris would utilize its Los Angeles plant rather than build or buy a plant at another location, such as San Francisco.

A third factor in favor of Los Angeles is the aircrafts parts industry, which could probably be converted readily to making automobile components. When plane manufacture slumps from its wartime rate, large numbers of the plane parts subcontractors will face the alternative of finding new products to manufacture or of going out of business. It is likely therefore that they will make every effort to obtain the Kaiser business.

Another reason for a Los Angeles location is the presence there of tire making facilities.

First summary of passenger car registrations in the U. S. to be made by R. L. Polk & Co. since 1941 has been made as of July 1, 1944, and it indicates car mortality has not been nearly as severe as popularly supposed. The figure of 5000 per day has been used widely as the number of cars being scrapped, but Polk's survey shows cars leaving the road at a rate of 3365 a day, and not all of these are being scrapped, since thousands of cars, particularly in the East, are being stored until the gasoline and tire situation eases, thus not showing on registrations.

Total registrations on July 1, 1944, were 24,114,922 units, compared with 27,700,011 three years previous. At this rate of decline, registrations on July 1 of this year would have declined to about 22,919,892. Chances are, however, the rate of decline slows as the overall total shrinks.

Of the total number of passenger cars licensed last year, a breakdown by makes shows the following order in the first ten: Chevrolet 6,079,937, Ford 5,536,418, Plymouth 3,041,222, Buick 1,542,725, Dodge 1,479,421, Pontiac 1,358,833, Oldsmobile 1,202,736, Chrysler 584,963, Studebaker 568,347 and Packard 435,664. Order is unchanged from 1941.

Widespread population shifts caus by wartime industrial movement a reflected in registration figures. some counties where production h been concentrated, registrations have i creased more than 50 per cent ov 1941 levels. Three states, Californi Oregon and Utah, showed increases i registrations, 1944 over 1941.

Henry Ford celebrated his eight second birthday last Monday and issue a prepared statement from his home i Dearborn, the first word from the ve eran manufacturer in many weeks. H said, in part, "The nation and the worl are on the threshold of a prosperity an standard of living that never befor was considered possible. There ar problems — human, economic and po litical — that must be solved. Emplo ment hinges on the right of private in dustry to go forward unhampered. Ther must be more and more industry, mor and more competition for greater excel lence in quality.

"Labor should be educated so it may know and understand the problem of industry and the full benefits of co operation. Industry wants to help in that education, given the chance. Man of the barriers between management and labor will dissolve when the chanc is given.

"We owe the men and women wh fought and are fighting in this war a debt. The Ford Motor Co. will no forget them. Nor will it forget those who were too young to fight, but wh were forced to live through the terror of war. The veterans of this war an these young men and women are th ones who will prevent its repetition."

New Valve Alloy Developed

New hard-facing alloy for automotive engine valves has been developed by metallurgists of the Wilcox-Rich Divi sion of Eaton Mfg. Co., called Eatonite It contains 40 per cent nickel, 30 chro mium, 15 tungsten, 10 cobalt, 2.25 carbon and the balance iron. The alloy is de signed to show improved wear and cor rosion resistance over stellite-type ma terial, particularly when subject to th corrosive attack of leaded fuels at high temperatures. It is applied to valves by conventional puddling methods, in thick ness of about 3/64-inch.

Coreroom operations at the Buick gray iron foundry will start Aug. 6 and the foundry itself will resume Aug. 8 after a brief shutdown for renovating and installation of new equipment. Pro duction of the Hercules engine block in process for the past several months has been completed.

OPA-approved price on the Willys peacetime jeep has been announced at $1090, f.o.b. Toledo, exclusive of ta and any extras, such as top, power take off, accessories, etc. This would appea to make the delivered price in the farmer's barn, with only basic accessories something like $1500.

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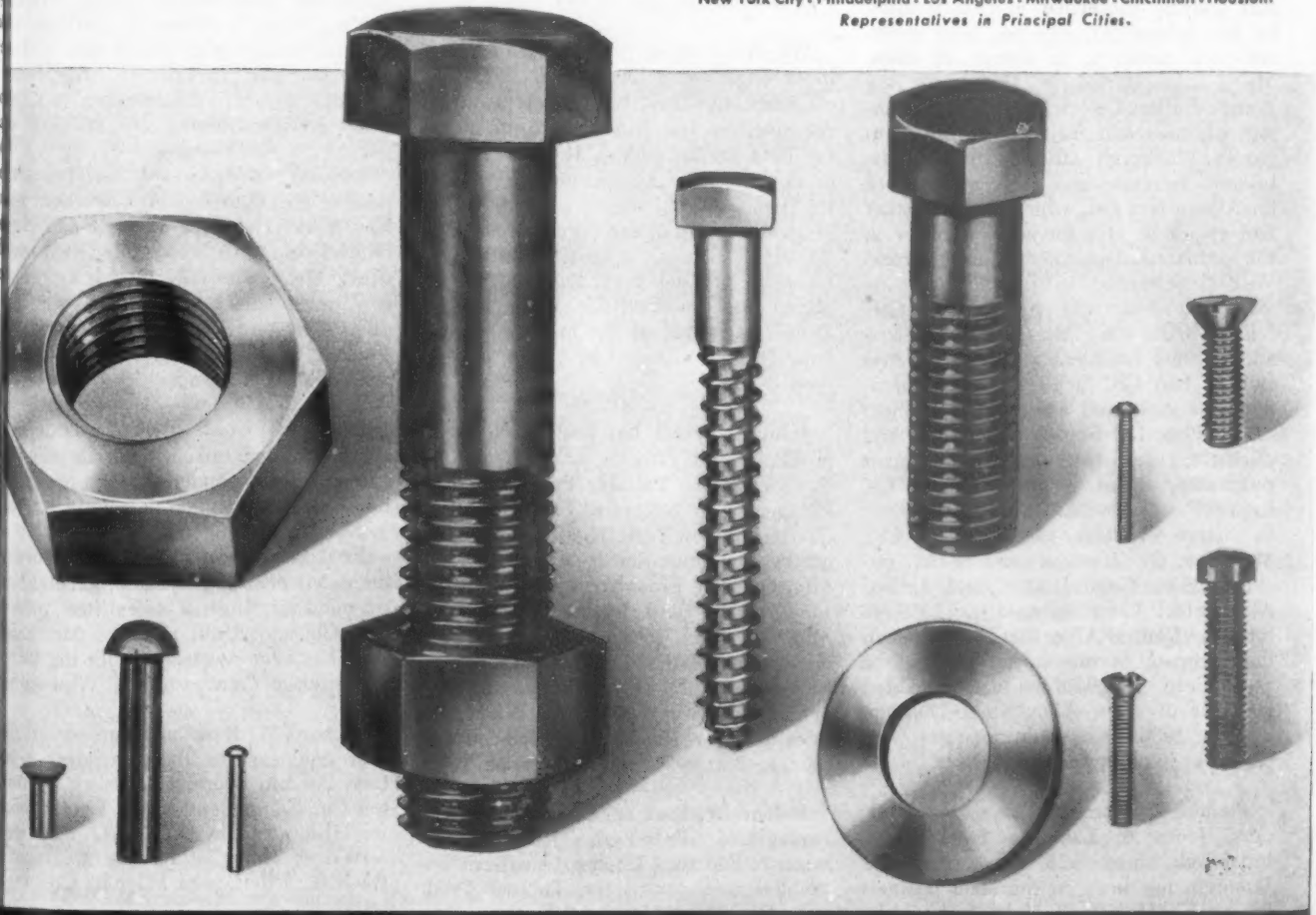

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MEN of INDUSTRY

N. J. CLARKE

WENDELL F. HESS

RICHARD O. LOENGARD

N. J. Clarke has been elected senior vice president and **J. M. Schlendorf** vice president in charge of sales, Republic Steel Corp., Cleveland. Mr. Clarke has been vice president in charge of sales for Republic since September, 1930, shortly after the corporation was formed, and will be succeeded in that position by Mr. Schlendorf, who has been assistant vice president in charge of sales. Mr. Clarke started in 1897 with the Bourne-Fuller Co., successively becoming salesman and manager of the company's Pittsburgh office. In 1912 he became secretary and sales manager of the Upson Nut Co., which Bourne-Fuller had acquired. He served as a major in the ordnance department during World War I, returning to Bourne-Fuller as vice president and general manager following the war. Mr. Clarke organized and became president of the Lake Erie Bolt & Nut Co. in 1919. Mr. Schlendorf was associated with American Sheet & Tin Plate Co. from 1905 to 1915, and during the next two years was assistant purchasing agent, Willys-Overland Co. In 1917 he was named vice president in charge of sales, Central Steel Co., Massillon, O. He continued in that position when Central Steel and United Alloy Steel Corp. merged in 1926 to form the Central Alloy Steel Corp. When that company became a part of Republic Steel Corp. in 1930 he was appointed manager of sales, Alloy Steel Division, and in 1936 was made assistant vice president in charge of sales.

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Fleming E. Jamieson, manager of orders, Jones & Laughlin Steel Corp., Pittsburgh, since 1913, has retired. Mr. Jamieson has been in the steel business 53 years. He joined Jones & Laughlin in 1912 and was appointed manager of orders in 1913.

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Robert H. Gardner has been appointed general manager of sales, A. M. Byers Co., Pittsburgh. Mr. Gardner has been manager of the company's Washington office since 1933 except for four years during which he was manager of the company's steel pipe sales. He takes over the duties of the late **Myron J. Czarniecki. H. R. Rowland** has been named assistant general manager of sales. He has been a member of the sales department since 1915 and in 1944 was named manager of hot rolled sales.

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Wendell F. Hess, professor of metallurgical engineering, Rensselaer Polytechnic Institute, Troy, N. Y., was awarded the American Iron & Steel Institute medal for 1944 for his paper, "Recent Progress in the Scientific Application of Welding to Steel," which was presented at the general meeting of the institute held May 25, 1944. Because of wartime restrictions on travel, the general meeting of the institute was canceled for 1945 and the award was made at the institute offices, New York, as reported by STEEL, July 30 issue.

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John C. Sykora has been elected vice president and director of sales for all divisions of the Portable Products Corp., Pittsburgh. Mr. Sykora will have his headquarters in New York. The five units comprising the corporation are C. J. Tagliabue Mfg. Division, Brooklyn; Coldwell Lawnmower and Philadelphia Lawnmower Mfg. Divisions, Newburgh, N. Y.; Paul & Beekman Mfg. Division, Pittsburgh; Strauss Mfg. Division, Pittsburgh. Mr. Sykora formerly was vice president and sales manager, Industrial Division, Gould Storage Battery Corp., Depew, N. Y.

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Roland W. Burt, until recently eastern manager of railroad sales, Joseph T. Ryerson & Son Inc., Chicago, has been appointed manager of the Tubular Products Division. Mr. Burt became associated with the company in 1923 and has served in various sales capacities.

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American Society of Mechanical Engineers has announced its annual awards will be made to the following: For distinguished service in engineering and science, **William Frederick Durand,** chairman, Division of Engineering a Industry, National Research Council; t Holley medal to **Dr. Sanford Moss,** G eral Electric Co. for his pioneer work turbo-superchargers; **Dr. Joseph M Juran,** assistant to the administrator, Fo eign Economic Administration, t Worcester Reed Warner medal; **Willia J. King,** Battelle Memorial Institute, t Melville prize medal; and **Bruce E. De Mar,** Douglas Aircraft Co., the Juni award. Formal presentations will b made in November.

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Richard O. Loengard has been a pointed president, United Chromium In New York; **Theodore G. Coyle** and **Hug D. McLeese** have been named vice pres dents. Mr. Coyle will continue as techn cal director and Mr. McLeese as gener sales manager. **Kevie W. Schwartz** h resigned as vice president but he will b available to the company as a consultan

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Frank H. Gordon, vice president charge of sales, Lukens Steel Co., Coate ville, Pa., has completed 50 years of co tinuous service with the company.

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Fred W. Eiselstein has been named the newly created position of general tra fic manager, United States Steel Supp Co., Chicago. Until recently, Mr. Eise stein has been associated with the Offic of Defense Transportation, Washingto

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Richard W. Berg has been named di trict engineer for the Pittsburgh ter tory, Bantam Bearings Division, Torrin ton Co., South Bend, Ind. Prior to joi ing the company in 1944, Mr. Be served as melter of electric arc furna steels with the Mesta Machine Co., Pitt burgh.

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C. W. Guyatt, formerly chief industri engineer, American Steel & Wire C Cleveland, has been appointed assistant **C. D. King,** chairman of operating co mittees, United States Steel Corp. Delaware, Pittsburgh. Mr. Guyatt join the American Steel & Wire Co. in 19

WILLIAM W. MALONEY

RAY E. VALENTINE

ROBERT W. MORGAN

as industrial engineer at Worcester, Mass., and after several promotions was made chief industrial engineer of the company in 1942. He will assist Mr. King in the establishment of production standards for all U. S. Steel subsidiary manufacturing companies. **Donald G. Dalton** has been appointed assistant general patent attorney for the patent bureau, United States Steel Corp. of Delaware. Mr. Dalton entered the patent department of the steel corporation in 1939.

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William W. Maloney, who has been business manager, American Foundrymen's Association, was elected secretary succeeding **Robert E. Kennedy** who has been named secretary emeritus. Mr. Maloney will also serve as chief administrative officer of the association. **Norman F. Hindle** was re-elected director of the technical development program, **C. E. Hoyt** was re-elected treasurer, and **Miss Jennie Reining** was re-elected assistant treasurer.

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Carl L. Liebau, for the past 11 years vice president in charge of sales, Federal Malleable Co., West Allis, Wis., is taking over the duties of **W. J. MacNeill** president and general manager, who has resigned. Mr. Liebau assumes responsibility of the management as vice president.

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R. A. Armstrong, for several years general sales manager, Michigan Seamless Tube Co., South Lyon, Mich., has been elected vice president in charge of sales.

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S. J. Mergenhagen recently joined the Pittsburgh sales organization, Heppenstall Co., Pittsburgh. For the past eight years, Mr. Mergenhagen has been district sales manager in Erie, Pa., for Brace-Mueller-Huntley Inc., Buffalo.

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Gilbert Soler, superintendent of the quality control departments, Steel & Tube Division, Timken Roller Bearing Co., Canton, O., has been named assistant general superintendent of the division. Starting with the company in 1931, he has served as a refractories engineer, manager of research, and prior to becoming superintendent of quality, was manager of research and mill metallurgy.

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Ray E. Valentine has been appointed St. Louis agent, National Malleable & Steel Castings Co., Cleveland. Mr. Valentine, who has been with the company since 1912, has been on loan to the War Production Board, Washington, since 1943 as chief of the Malleable Iron Section.

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Don Poor has been appointed advertising manager of the Ceco Steel Products Corp., Omaha, Nebr., and he will have headquarters in the company's Manufacturing Division, Chicago. For the past five years, Mr. Poor has been assistant advertising and sales promotion manager, Lyon Metal Products Inc., Aurora and Chicago Heights, Ill.

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Rhoades V. Newbell has been appointed manager of the Advertising and Sales Promotion Division, Deepfreeze Division of the Motor Products Corp. at North Chicago, Ill. He formerly directed advertising for the Magnavox Co., Ft. Wayne, Ind.

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Leonard Happ, who has been with the T. E. Conklin Brass & Copper Co. Inc., New York, for 34 years, has been elected assistant secretary and general manager. **William W. Doxey** was appointed assistant general manager.

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B. C. Cubbage has been named eastern sales manager, Construction Sales Co. Inc., New York, and he will have his offices in Albany, N. Y.

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Frederick F. Robinson, president, National Aviation Corp., New York, has been elected a director of Bell Aircraft Corp., Buffalo.

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John A. Coe Sr., has resigned as chairman, American Brass Co., Waterbury, Conn., and is succeeded by **Clark S. Judd,** formerly president. **Arthur H. Quigley,** formerly executive vice president, has been elected president. **John A. Coe Jr.,** formerly vice president in charge of sales succeeds Mr. Quigley as executive vice president.

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Robert W. Morgan recently was appointed chief engineer, Fedders Mfg. Co. Inc., Buffalo. Mr. Morgan will direct all the company's engineering activities.

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E. W. Ferry, president, E. W. Ferry Screw Products Inc., Cleveland, was elected president of the Cleveland Athletic Club at its annual meeting. **Frank A. Michell,** SAE Steels Inc., was elected vice president.

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V. S. Herrington, San Francisco, has been appointed district manager for the Transportation Division, Apparatus Department, General Electric Co.

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Charles H. Hirst has been named sales manager for mining equipment and machinery, Joshua Hendy Iron Works, Sunnyvale, Calif. Mr. Hirst formerly was supervisor in the Ordnance Division.

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W. S. Dawson, manager of the Wellington, O., plant, Cleveland Steel Products Corp., has been elected vice president, Romec Pump Co., Elyria, O. **V. J. Peterson,** tool room foreman, succeeds Mr. Dawson as manager.

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E. A. France, son of Adam W. France, founder of the France Packing Co., Philadelphia, has been elected president and general manager. **J. C. Allen** is treasurer.

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Paul C. Jones has been named field technical manager, B. F. Goodrich Chemical Co., Cleveland. Mr. Jones has been associated with the company since 1927, and has been technical representative on chemical sales.

—o—

James F. Pedder, formerly advertising manager, Frigidaire Division, General

JOHN D. TULLY

Manager of sales, rails and accessories, Bethlehem Steel Co., Bethlehem, Pa., as noted in STEEL, July 16, p. 102

WILLIAM E. BREWSTER

General superintendent, Wisconsin Steel Works Division, International Harvester Co., Chicago, STEEL, July 23, p. 98

W. H. WILLIAMS

Who has been elected president, Clark Controller Co., Cleveland, as noted in STEEL, July 30, p. 66

Motors Corp., is joining the newly created employee co-operation staff of the corporation. He will be director of employee information and will have his headquarters in Detroit. Mr. Pedder is succeeded as advertising manager of Frigidaire by **F. H. Peters,** manager of range and water heater sales.

—o—

S. H. Standish, general manager of the G.H.R. Foundry Division, Dayton Malleable Iron Co., Dayton, O., has been named vice president in charge of engineering. **W. J. MacNeill,** formerly president, Federal Malleable Co., West Allis, Wis., succeeds Mr. Standish as general manager of the G. H. R. Foundry Division.

—o—

L. J. Edwards has been named field manager, General Alloys Co., Boston. Mr. Edwards will supervise the company's field engineering and sales activities. Succeeding Mr. Edwards as New England district manager is **B. W. Bittner** who formerly was assistant manager of the engineering department.

—o—

Leon R. Baker, European manager, Lempco Products Inc., Bedford, O., recently returned to the United States for a month to renew personal contacts with manufactures.

OBITUARIES . . .

Philip B. Gale, 71, chairman, Standard Screw Co., New York, and its subsidiaries, died at his home in Bloomfield, Conn. He became first vice president of the company in 1917, later becoming president and he was elected chairman of the board in 1930.

—o—

William H. Bryant, 54, Chicago sales manager, Joseph T. Ryerson & Son Inc., Chicago, died July 23 near Iron Mountain, Mich. Mr. Bryant had been associated with the company since 1906.

—o—

Boyd E. Keifer, 51, Cincinnati, division manager for the Timken Roller Bearing Co., Canton, O., died July 25 in Kalkaska, Mich. Mr. Keifer had been division manager for the Timken company in the Cincinnati territory for the past 18 years.

—o—

Daniel Gartling, 96, co-founder and owner, California Well Tool & Machine Works, Los Angeles, died at his home July 20.

—o—

Jacob Edge, 59, first vice president and sales manager, Downingtown Mfg. Co., Downingtown, Pa., died July 24.

—o—

John T. Booth, 67, a veteran of nearly 50 years' service with the National Malleable & Steel Castings Co., Cleveland, died at his home in that city July 29. Mr. Booth first became associated with the company in 1897, and had been a department superintendent at the Cleveland plant for 18 years.

—o—

Charles E. Rapp, 62, assistant to the vice president, Westinghouse Electric Corp. in Jersey City, N. J., died July 27.

—o—

George J. Meyer, 74, head of the George J. Meyer Mfg. Co., Cudahy, Wis., died at his home July 30.

—o—

Neil I. McArthur, 55, vice president of Great Lakes Foundry Sand Co., Detroit, died in Charlevoix, Mich., July 24.

—o—

Whitford C. Gillies, vice president, Construction Sales Co. Inc., New York, died July 28 in Albany, N. Y.

—o—

Robert E. Hunter, 51, president, Hunter Construction Co., Youngstown, died recently in that city. He became president of the company in 1927.

—o—

Horace D. Campbell, 75, president and general manager, Campbell Heating Co., Des Moines, Iowa, died in that city recently.

—o—

Charles Kendall Foster, 77, a director of the American Radiator & Standard Sanitary Corp., Chicago, with which he had been associated for 53 years, died July 28 in New York. He joined the American Radiator Co. in 1892 as an assistant secretary and retired from active participation in the organization in 1939 as executive vice president. He also was a director of the American Steel Foundries, Chicago.

—o—

Frederick Fisher, 68, president, R. E. Ellis Engineering Co., Chicago, died July 30 in that city. He had been associated with the company since 1916 and had been active in the machine and tool industry more than 30 years. Mr. Fisher was a member of the machine tool panel of the Chicago Ordnance District.

—o—

Jack H. Wilson, 49, for the past 12 years sales engineer in the Cincinnati office, A. Finkl & Sons Co., Chicago, died July 25 in Cincinnati as result of an automobile accident. For the past six years, Mr. Wilson was also the representative in the Cincinnati district for Acme Machinery Division, Hill Acme Co., Cleveland.

—o—

John W. Westcott, 73, secretary and treasurer, Wagner Electric Corp., St. Louis, died July 20. He had been associated with the Wagner company for 47 years and was elected to the board of directors in 1927.

—o—

John J. Hoppes, 87, president of the Hoppes Mfg. Co., Springfield, O., died recently in that city.

Krug Warns Coast Industrialists Not To Neglect Reconversion Plans

WPB chairman says area is entering crucial period in which full pressure of war production will be felt. Sees great industrial future for district but admonishes business leaders they will have to work out their own destiny

THE ENTIRE West Coast is entering a crucial period in which the full pressure of Pacific war demands will be felt. At the same time, the West must not neglect plans for reconversion so as to avoid more than the necessary postwar dislocations.

This was the double-barreled admonition given recently in Los Angeles by J. A. Krug, chairman, War Production Board, as he neared the end of a western tour of industrial centers.

In affirming previously stated policy on reconversion, Mr. Krug put the emphasis on individual business initiative. Foreseeing great industrial growth for the West, he declared that people of the West will have to work out their own destiny and not depend upon Washington "masterminds" to do it for them.

Mr. Krug predicted booming business long after the war for the Los Angeles area as well as other centers where repairing and overhauling of the gigantic American fleet will be done. He also forecast unprecedented prosperity for the service trades which will maintain the new machines to be built for homes and businesses. He voiced an opinion that most of the persons who have settled in southern California will find jobs in its expanding civilian industries.

Mr. Krug emphasized that present worker shortages in certain industrial centers, including Los Angeles, which have shown meteoric growths since the war began, will not show vast improvement until chronic housing shortages are eliminated so as to catch up with the new populations.

Employment at 3-Year Low

Factory employment in the Los Angeles industrial area fell to 325,000 workers in June, the lowest level in three years, according to a report from the California Department of Industrial Relations.

Peak of payrolls was in August, 1943, when 475,000 were employed in all industries in the area.

The number in aircraft in Los Angeles is now 100,600; in shipyards, 48,100. In rubber, employment drops have been comparable.

Figures for the entire state of California put the number of workers in iron and steel plants at 47,300 at the end of June. There are 42,300 men and women now working in the machinery industry.

Sale or lease of large government industrial properties on a basis of subdivision or space shared by many businesses was discussed last week in Los Angeles at a meeting at which Parley P. Eccles, representative of the Senate Surplus Property Subcommittee, conferred with Southern California industrialists.

The conference was called by the Los Angeles Chamber of Commerce Industrial Department to suggest possibilities by which individual firms might purchase space in sections of plants too large for exclusive use by one company.

Workers Leaving Essential Jobs in Pacific Northwest

Figures released by A. F. Hardy, Washington state manpower director, reveal that 4000 war workers a month are leaving essential jobs in the Puget Sound area and returning to their homes in the East.

"This is not a net loss," he stated, "because we may have about 3000 new workers come into the area monthly. But it is like taking one step forward and falling back two."

Industrial Expansion Continues on Coast

PLANS for industrial expansion in northern California announced during the first half of this year total nearly $35 million, the San Francisco Chamber of Commerce reports.

According to the compilation, 176 new factories will be built at a cost of $26,452,400 and 153 plants will be expanded at a cost of $8,446,500. Nearly all of the projects are in the San Francisco Bay area. Most of them will not be undertaken until materials and manpower are more plentiful.

During June $505,000 was invested in new factories in Los Angeles county and 210 new jobs created thereby. In the same month, 26 existing plants were expanded at an additional investment of $1,538,000, creating 461 new industrial jobs, according to the industrial department, Los Angeles Chamber of Commerce.

Total investments in 1945 so far have been $20,500,000 in the county, which is approximately 5 per cent less than investment in like undertakings during the first six months in 1944.

New industries in the Los Angeles area include:

Ferro Enamel Corp., Cleveland, will build a branch plant at 5901 S. Riverside Drive, Los Angeles, for manufacture of porcelain enamel frit and synthetic enamel industrial paints. John A. Rumer will be Los Angeles manager. Cap-Tin Development Corp. of California, 635-645 S. San Pedro St., has begun manufacture of zippers of all types. Robert Rosenbloom is secretary-treasurer and manager. Best Screw Products Co., 11354 S. Atlantic Blvd., Lynwood, making screw machine products. Herbert W. Dane, manager.

Felbro Wire Products Co., 3013 S. San Pedro St., manufacturing lamp shades and other wire products. Kurtis Kraft, 1107 E. Colorado Blvd., Glendale, producing jigs, fixtures and aircraft parts. Postwar plans include manufacture of racing cars. Lacal, 8383 Sunset Blvd., patterns and molds, tools and machine designers; W. E. Abbott is owner.

Expansions include:

Essick Mfg. Co., 1950 Santa Fe Ave., has acquired 22,000 sq. ft. of land at 2416 E. 14th St., with 20,000 sq. ft. of floor space. Another building is planned with 12,000 sq. ft. At 2010 Santa Fe Ave., 4000 sq. ft. are being added. Company makes aircooling systems, hoists, contractors' pumps, concrete mixers, road rollers and spraying

Kinney Industries, 275 N. Avenue 19, plan 25,000 sq. ft. building on S. Flower St. A. T. Case Co., 6100 Avalon Blvd. is building 16,000 sq. ft. plant at 1532 California Ave., Monrovia, and will move there about Oct. 30. Company makes food processing units and surgical sterilizers. Coast Coil Spring Co., 11703 S. Main St., is erecting 15,000 sq. ft. building at 123 E. 58th St. Kruse Metals Mfg. Co., 1359 Channing St., constructing 14,000 sq. ft. addition at 1355 Channing St.

Ferris Screw Products Co., 3629 Medford St., is erecting 3800 sq. ft. building at 10541 Dolores Ave., South Gate. Westcraft Machine & Engineering Co., 1334 Canal St., Long Beach, is erecting 8000 sq. ft. machine shop at 1451 Canal St., Long Beach. Garland Engineering Co., 3220 Ardmore Ave., South Gate, has built 7000 sq. ft. office and machine shop at 4120 Ardmore Ave., South Gate. Vernon Pattern Works, 5107 Pacific Blvd., has built 7000 sq. ft. addition for production of dies and tools. Allen Mfg. Co., 6021 Compton Ave., erecting 6500 sq. ft. building at 84th St. and Graham Ave. Produces screw machine products, aircraft parts, hydraulic units, radio parts, etc. Capitol Brass & Aluminum Foundry, 1822 E. 58th Place, adding 3100 sq. ft. Rankin Mfg. Co., 3072 W. Pico Blvd., is occupying 8000 sq. ft. at above address for manufacture of welding rods.

WING TIPS

New Curtiss-Wright V-Tab permits maximum loading of heavy planes without consideration of weight distribution. Center of gravity need be bugaboo no longer. Permits maximum utilization of cargo and passenger space

CENTER of gravity, bugaboo of pilots and maintenance men ever since man's first powered flight, becomes a minor problem as the result of Curtiss-Wright Corp.'s development of a revolutionary trim tab device for transport aircraft. Known as the V-Tab, the invention allows maximum loading of planes without consideration of weight distribution.

Details of the V-Tab, which while adding only 10 pounds to the total weight of the Commando results in an amazing "CG" range and vastly improved airplane stability, were announced by Curtiss-Wright last week. The new device already is in operation on the C-46, military version of the Commando which will fly on many of the nation's airlines when war conditions permit. Delivery of the Wright-powered CW-20 commercial Commando will begin soon after the first of the year.

Maximum utilization of cargo and passenger space in the Commando—is the greatest boon of the V-Tab, which does not affect the airplane's speed and which operates automatically. Pilots no longer will have to trim ship while passengers walk back and forth in the cabin, and airline maintenance men will have to worry only about the total load of passengers and cargo, rather than figuring out distribution of weight by a complicated slide rule procedure.

Nor will it be necessary to shift cargo from one compartment to another while passengers have to pace restlessly back and forth at airports, a frequent occurrence today. It will no longer be necessary to "ground" passengers when there are vacant seats, because of cargo loaded so that rearward seats may not be used. The device is seen as hurdling one of the greatest barriers to "flying club cars" of tomorrow, since it assures the free movement of passengers during flight.

Pilots, especially, will benefit from the V-Tab. Both in present military operations and in the airline runs of the future, Commando crewmen will be subjected to less fatigue since the tab will keep the ship in balanced flight.

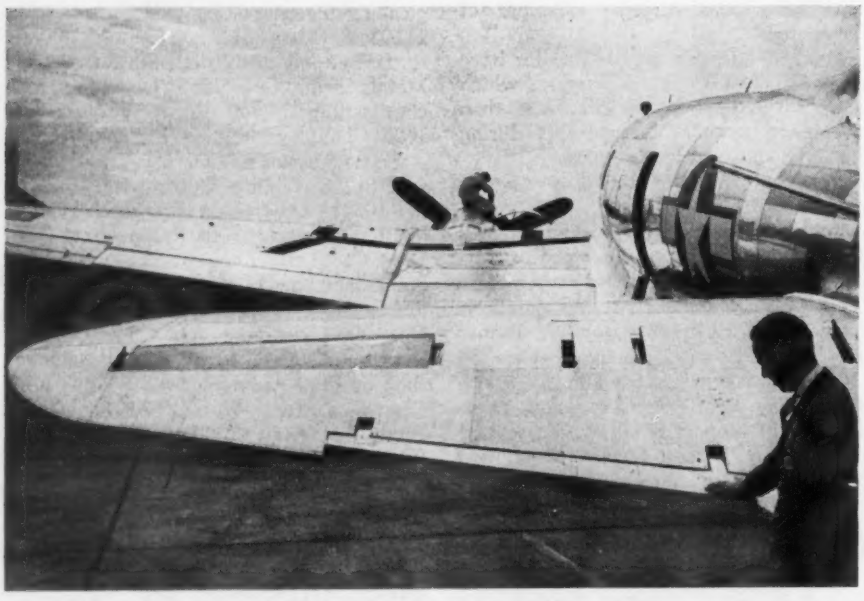
Aid Troop Carriers

Perhaps the most immediate beneficiaries of the development will be the pilots of Commandos operated by the Army's Troop Carrier Command. These men have taken a terrific beating in the past, trying to keep their giant planes in level flight and in close formation while 36 paratroopers charge down the cabin and jump out the double doors in the rear of the fuselage. With the V-Tab installation, the shift in weight and "CG" caused by movement of paratroopers will be compensated for automatically. Pilots no longer will have to fight to keep their airplanes in straight and level flight.

The V-Tab, too will take a load off the shoulders of the Army, Navy and Marine Corps men who load cargo-carrying Commandos for vital war missions. Now, it will be a question of simply how much to put aboard, rather than exactly where to place what part of the load in the cargo compartments. The same, of course, will apply to loading of airline Commandos when they go into operation. Once the Commando is loaded, the V-Tab will take care of the airplane's balance in flight.

Operating with the same conventional trim controls which are standard in all transport planes, Curtiss Commandos already have achieved an unusual record as cargo and troop-carrying aircraft all over the globe. Making up the backbone of the vast sky freight fleet operating over the famed India-China Himalayan "Hump," C-46 Commandos also are daily flying thousands of miles across the Pacific for the Marine Corps as hospital planes and high-priority cargo haulers. Several months ago, they were designated as the standard aircraft for the Troop Carrier Command.

With the V-Tab installation, the Commando will prove even more a "pilot's airplane." And, completely tested under the rigorous conditions of war, it will take its place as the top twin-engined transport of the nation's airlines as soon as war conditions permit production of luxury liners of the air.



This simple control surface, indicated by Curtiss-Wright test pilot, will greatly simplify peacetime operation of airline transport planes. Operating automatically, it eliminates the necessity—as the plane's load is increased or lessened at various stops—for shifting of cargo to keep the plane in safe balance

Partial Details Revealed About Consolidated B-32

Partial details of the newest of the Army Air Forces big bombers, the long-restricted Consolidated B-32, sister ship of the Boeing B-29, have been released with announcement the plane is in service against the Japanese.

Featuring heavy fire power and bomb load the B-32 was designed especially for operations in the Pacific. Although certain details are not yet available it is known to carry sizable bomb loads for long distances at speeds exceeding 300 mph.

It is an all-metal, high-wing, single tail monoplane with a cylindrical, semi-monocoque fuselage and a modified Davis low-drag wing with fowler type flaps. The tricycle landing gear which uses dual tires, is fully retractable and has a completely swiveling nose wheel.

Power is supplied by four double-row, 18-cylinder Wright Cyclone engines of 2200 hp, each equipped with two exhaust-driven turbo-superchargers. The Curtiss 4-blade electric propellers have a diameter of 16 ft 8 in and are equipped with Curtiss automatic synchronizers. Propellers on the two inboard engines have reversible pitch blades for braking during the landing run.

Wing span of the B-32 is 135 ft; length is 93 ft 1 in; and height is 32 ft 2 in. It has a wing area of 1422 sq ft and a gross weight of approximately 100,000 lb. Overloaded it weighs 120,000 lb; empty, more than 60,000 lb.

The B-32 was developed by the Con-

If you paint Zinc-Coated products

CHECK THESE 6 POINTS

Here are six questions and answers about paint characteristics on two different zinc-coated sheet steels. Checking them may help save you time and money.

			Ordinary Galvanized Steel	Armco Galvanized Paintgrip
✓	1	Does it take paint without pre-treatments?	No	Yes
✓	2	Is the full-weight zinc coating intact?	No*	Yes
✓	3	Is paint "insulated" from the zinc coating?	No	Yes
✓	4	Does the zinc surface rob paint of its oils?	Yes	No
✓	5	Will paint adhere . . . without premature peeling or flaking?	No	Yes
✓	6	Does paint resist scraping or other abrasive action?	No	Yes

*Acid etching, used as a pre-treatment for painting, destroys part of the zinc coating.

THIS TELLS THE STORY OF TRIPLE PROTECTION

Advantages of ARMCO Galvanized PAINTGRIP over ordinary galvanized for all painted products are clearly illustrated in this "peel-off" drawing.

The full-weight galvanized coating is "insulated" from the paint finish by the mill-Bonderized PAINTGRIP surface treatment. On ordinary galvanized there is no "insulation." The zinc robs paint of its oils, causes it to become brittle.

Actually it costs less to use ARMCO PAINTGRIP sheets than to use ordinary galvanized and acid-etch before painting. And PAINTGRIP keeps the paint on your products looking better longer.

Write for the free ARMCO PAINTGRIP booklet. It gives complete information on fabricating, finishing and applications of this steel. Just address The American Rolling Mill Company, 2471 Curtis Street, Middletown, Ohio.

EXPORT: THE ARMCO INTERNATIONAL CORP.

GALVANIZED PAINTGRIP ARMCO STEEL

Special-Purpose Sheet Steels

THE AMERICAN ROLLING MILL COMPANY

NAVY HELICOPTER: The PV-3, large helicopter manufactured by the P-V Engineering Forum Inc., Sharon Hill, Pa., under direction of the Navy Bureau of Aeronautics, is shown here in test flight. The craft was designed for Navy-Coast Guard air-sea rescue and for air transport operations. It is claimed to be the first successful design using configuration of two rotors in tandem. NEA photo

solidated Vultee Aircraft Corp. in cooperation with Maj. Gen. Hugh J. Knerr's Air Technical Service Command, and was built initially at both the company's Ft. Worth and San Diego plants. Since last May, however, limited production continues at the Ft. Worth facility.

Normal crew is eight and the first of the B-32 crews to see combat are former Liberator crews, except for the aerial engineers, who had finished their operational training in the Fourth Air Force and who were converted to the B-32.

Transition training for B-32 crew members, which was begun last February, is being provided by Lt. Gen. Barton K. Yount's AAF Training Command at the Ft. Worth Army Air Field, Texas. It is the first time in World War II, incidentally, that a new tactical type of aircraft was assigned the Training Command before it was engaged in operational training. Previously the first planes off the production line, aside from those required for test purposes, were sent to one of the training air forces in the continental United States.

Jet-Propelled P-80 Clips Off 550 mph, Has Service Ceiling of Nearly 9 Miles

ADDITIONAL details of the first production-line AAF jet-propelled fighter—the P-80 Shooting Star—were revealed to the public last week with showings of the new plane, now moving swiftly toward combat operations against the Japanese.

Hurdling the 550 mph barrier, where efficiency of present conventional engine propeller combinations had begun to restrict airplane performance, "the AAF is at the bottom rung of a new ladder of progress that starts with the P-80," according to the Air Technical Service Command, Wright Field, O.

The Shooting Star, according to ATSC, will clip off 550 mph at any altitude and has a service ceiling of 45,000 ft.

The P-80 has a wing span of 39 ft and an overall length of 34 ft 6 in. From the ground to the top of its rudder it measures 11 ft 4 in. Its total empty weight is only 8000 lb, although it has an armor glass windshield and steel armor all over the front bulkhead and the back of the pilot's seat.

Engine fuel is kerosene, preferable to gasoline because it provides more energy per gallon. This energy is transformed into "pounds of thrust," which is the term used in measuring jet power instead of the more familiar word—"horsepower." The engine can be completely removed and replaced in the airplane in 20 minutes instead of the usual 8 to 9 hours!

In addition, the elimination of the propeller, ignition system, carbureter, and the complex propeller and engine controls of the conventional fighter plane simplifies manufacture and maintenance of the P-80 a hundredfold.

Lubrication of the P-80's jet engine is ridiculously simple—the shaft connecting the turbine wheel and the compressor impeller is the only moving part and requires oil at some half dozen bearings.

The jet plane operates at optimum fuel consumption at high speed in contrast with conventional fighters whose best fuel economy is secured at reduced power and speed.

Contrary to the common impression, the P-80 does not come in for a landing at blinding speeds, but rather glides in on its approach at the same speeds as ordinary fighters and makes contact with the runway around 100 mph.

Pilot's Visibility Improved

Since the engine is not located in the nose, the pilot's compartment is located well forward offering a notable improvement in visibility. The ship's battery of guns are also packed in the nose which reduces gunfire dispersion.

In addition to smooth and easy flight, the pilot gets another break in the P-80. It has a pressurized cabin. In the slender fuselage of the P-80, this was quite a problem. Some 14 valves, units and "muffs" had to be squeezed into an exceedingly small space. It's semi-air-conditioned too—the pilot can make it hot or cold to his liking.

The P-80 is well armed, with six 50-caliber guns compactly mounted in the nose, so as to get maximum fire concentration at any distance. The guns are mounted at the bottom of the nose to preclude the possibility of the pilot being bothered by gun flashes at night or on dark days. Mounting the guns lower than the ammunition boxes harnesses the force of gravity to aid ammunition feed to the guns. The gun-sight is an electrical gyro lead computing type with a reflex optical system.

Predicts 3½ Million Pilots in 15 Years

America will have a minimum of 3,500,000 licensed private fliers by 1960 if progress made since 1929 continues at the same rate during the next 15 years, William A. Mara, Bendix Aviation Corp. staff executive in charge of developments relating to the personal airplane, predicts.

Since 1929, when Civil Aeronautics Administration records listed only 4162 licensed private pilots, the nation's roster of accredited personal plane pilots has climbed to 107,327 at the end of 1944, Mr. Mara's report revealed. This represented an increase of 2600 per cent in 15 years.

Mara emphasized that his forecast of 3,500,000 licensed private pilots by 1960 was "extremely conservative" when all factors which will tend to accelerate development are considered.

Every refrigeration man needs this new catalog!

Designers, engineers, service-men, purchasing agents—every key department head in the refrigeration field—should have this new Weatherhead Refrigeration Catalog. It gives you at a glance detailed, illustrated data on the multitude of *improved* refrigeration parts Weatherhead engineers have designed and created for original installations and replacement work. Write or call one of our branch offices for a free copy of this 40-page catalog.

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U. S. Steel Corp. Subsidiary Will Buy Pump Firm

Acquisition will establish Oil Well Supply Co. as California manufacturer of oil field materials

OIL WELL Supply Co., subsidiary of United States Steel Corp., New York, has announced its intention to exercise an option for purchase of Neilsen Pump Co., Long Beach, Calif. This acquisition will establish Oil Well Supply Co. as a California manufacturer of oil field materials.

In addition to its main plant facilities at Long Beach, Neilsen Pump Co. has a large shop and warehouse at Taft, Calif., and stores and sales offices at Bakersfield, Huntington Beach, and Ventura, Calif.

Under the projected purchase plan the Neilsen company's assets will be organized into the Neilsen Pump Division of Oil Well Supply Co. The Neilsen company, which manufactures subsurface pumps and accessories, will continue to emphasize field service and high quality products.

No significant changes in personnel or establishment are contemplated, according to Albert R. Zelt, vice president, Oil Well Supply Co., Dallas, Tex. Karl P. Neilsen will remain with the organization as general manager of Neilsen Pump Division. Mr. Neilsen and Edward D. Sports had been partners in ownership of the Neilsen company, which had been established in 1926.

Neilsen pumps have been sold only in California. Company officials said that as soon as adequate service facilities can be established and field personnel trained, distribution of Neilsen products will be inaugurated in other divisions of Oil Well Supply Co., both domestic and foreign.

Group Collects 1000 Tons Of Heavy Scrap in Month

More than a thousand tons of heavy melting steel scrap were added to the nation's depleted supplies in a month by a volunteer businessmen's group in an upstate New York county.

The county, Ilion, was one of those whose volunteer Industrial Center Organization Committee had been remobilized to meet the threat of dangerously low supplies of heavy melting scrap. The Ilion county group collected 1000 tons of heavy melting steel and 67 tons of cast scrap.

EXPANDED SLAG PLANT: Lightweight Celocrete aggregate will be manufactured in this recently opened government-owned plant operated by Republic Steel Corp. in South Chicago, Ill. Shown here are the storage hopper, having a capacity for about 30 carloads of the expanded slag, and part of the conveyor system. The South Chicago plant brings to five the number from which the aggregate is merchandised by Celotex Corp. Others are in Cleveland, Buffalo, Pittsburgh and Troy, N. Y.

BRIEFS . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Bendix Aviation Corp.'s Eclipse Machine Division, Elmira, N. Y., is now producing starter drives needed in reconversion of the automotive industry.

—o—

Tate-Jones & Co. Inc. announces that its offices are now located at 804 Plaza building, Pittsburgh.

—o—

Fairbanks, Morse & Co.'s Pomona Pump Works, Pomona, Calif., has received the National Safety Council's award for distinguished service to safety.

—o—

Grinders & Fixtures Inc., Cleveland, has acquired from Cleveland Tool Engineering Co., Cleveland, all manufacturing rights to the latter company's two principal products, the circular relief grinder and universal indexing head.

—o—

Ward Leonard Electric Co., Mt. Vernon, N. Y., has appointed Wright Engineering Co., Indianapolis, as sales representative in southern Indiana, southwestern Ohio and Kentucky.

—o—

Electric Air Heater Co., Mishawaka, Ind., has changed its name to Electromode Corp.

—o—

Berger Machine & Mfg. Co., Cleveland, has taken over the production divisions, plants 2 and 3, of the Lorain Machine & Tool Co., Cleveland. Plant 1 of Lorain Machine & Tool has been taken over by Grothe Machine Tool & Die Co., Cleveland, which has no connection with the Berger company.

—o—

Geometric Tool Co., New Haven, Conn., has appointed the following distributors in Michigan: B-H Tool & Supply Co., C. L. Gransden & Co., and Rayl Co., Detroit; Gransden-Hall & Co., Flint; Grand Rapids Supply Co., Grand Rapids; C. E. Hamlin & Co., Jackson; Hoover Supply Co., Kalamazoo; Precision Tool

& Supply Co., Lansing; Cutting Tools & Supply Co., Pontiac; and Port Huron Equipment Co., Port Huron.

—o—

American Radiator & Standard Sanitary Corp.'s stamping plant at Buffalo will expand its production of civilian products in the postwar period. The firm is shifting its automatic furnace production from Elyria, O., to Buffalo.

—o—

Cooper-Bessemer Corp., Mt. Vernon, O., has named Northern Marine & Engine Co., Toronto, Canada, as its representative in Labrador and in Ontario, Quebec, New Brunswick, and Prince Edward Island, Canada.

—o—

Federal Products Corp., Providence, R. I., manufacturer of precision measuring instruments has established a field engineering service department to co-operate with users of its instruments.

—o—

Sam Tour & Co. Inc., New York, metallurgists, have been certified by the New York State Department of Labor to test window cleaners' belt anchors in a program to make safe all such anchors in the state.

AWARDS . . .

The Army-Navy "E" award for excellence in manufacture of war materials has been given the following:

Daybrook Hydraulic Corp., Bowling Green, O.
Fansteel Metallurgical Corp., Vascoloy-Ramet Corp., Waukegan, Ill.
Keystone Drawn Steel Co., Spring City, Pa.
Komp Equipment Co. Ltd., Shell Plant Division, Hattiesburg, Miss.
National Formetal Co., Cleveland.
Radio Steel & Mfg. Co., Chicago.
Rochester Mfg. Co., Rochester, N. Y.
Schlosser Mfg. Co., Philadelphia.
Standard Electric Time Co., Springfield, Mass.
Templeton, Kenly & Co., Chicago.
Triplex Screw Co., Cleveland.
United States Rubber Co., Providence plant, Providence, R. I.
Western Electric Co. Inc., Lincoln shops, Lincoln, Nebr.
D. Wilcox Mfg. Co., Mechanicsburg, Pa.

Pittsburgh Firms Establish Export Sales Organization

Formation of Pittsburgh International Corp. to handle export sales and distribution of products manufactured by Pittsburgh Equitable Meter Co., Pittsburgh, and its subsidiary, Merco-Nordstrom Valve Co., Pittsburgh, has been announced.

The new firm, whose offices will open Sept. 1 in 7701 Empire State Bldg., New York, will be directed by A. L. DiGiulian, vice president. Prior to accepting his new position, Mr. DiGiulian was chief, Foreign Communications Section, Office of Exports, Foreign Economic Administration, Washington. In operating the new export firm he will be assisted by George E. Doty, who has been associated with the Oakland, Calif., plant of Merco-Nordstrom.

J. & L. Expansion Plans Announced

A $12 MILLION tin plate expansion program is underway at Jones & Laughlin Steel Corp.'s Aliquippa, Pa., works which will increase output 50 per cent.

The company's long-range program to increase production of finished steel items at all its plants will be accelerated considerably with installation of five-stand, four-high, 42-inch cold reduction mill, already ordered from Mesta Machine Co., West Homestead, Pa., and some auxiliary equipment at the Aliquippa works. These facilities are expected to be in operation within a year.

Production of cold-rolled sheets at its Pittsburgh plant will be increased 3000 tons to 33,000 tons per month by Sept. 1 through rearrangement of facilities. The 54-inch mill at Pittsburgh will continue to supply cold-reduced steel for tin plate as needed, but when the new 42-inch mill is installed, the 54-inch mill will be relieved of the necessity to roll tin mill coils for the Aliquippa works.

Company officials state that the new tandem mill ordered will operate at a speed faster than any similar mill now in use in the industry.

Improvements at the wire mill at Aliquippa works have also been under way recently with installation of additional wire drawing blocks.

The company has also arranged for a $3 million improvement program at the Otis works, Cleveland, where sheet capacity will be increased and quality control standarized with that of the output at the Pittsburgh works. This installation will get underway in February.

New Alloy Steel Patented, Pittsburgh Firm Announces

Alloys Development Co., Pittsburgh, has announced the award to the late Dr. Byramji D. Saklatwalla of U. S. Patent No. 2,378,437 covering a new high-strength, corrosion-resistant steel possessing ductility, toughness, and good welding properties.

The steel contains essentially: Carbon, 0.14 per cent maximum; manganese, 0.50 per cent maximum; phosphorus, 0.07-0.18 per cent; chromium, 0.25-1.5 per cent; nickel, 0.25-1.5 per cent; molybdenum, 0.07-0.60 per cent; and copper, 0.18-0.75 per cent. Being low in carbon and manganese, the steel promises to provide an effective outlet for "tri-alloy" scrap in the form of a structural steel suitable for welding, the firm says.

IMPROVED PRODUCTION: Four early model gages and precision instruments that revolutionized quality control of mass production were presented to the Smithsonian Institution in Washington by Louis Polk, left, president of the Sheffield Corp., Dayton, O. Questioning Mr. Polk about the gages are Dr. Alexander Wetmore, center, secretary, Smithsonian Institution, and Lt. Gen. L. H. Campbell, chief, Army Ordnance

1945 SPECIFICATIONS F

Clean-cut specification written by AWS and ASTM for mild steel and low-alloy electrodes permits consumers to make rigid and complete demands on manufacturers. Guide to Classification and reiteration of rule specifying single assignment of grade numbers are worthwhile additions to data

TABLE I

SUMMARY OF TEST REQUIREMENTS

Classification Number	Electrode Diameter, Inches	Current and Polarity	All-Weld-Metal Tension Test*	Usability Tests Guided-Bend Test*†	Usability Tests Fillet-Weld Test*†
E4510	1/16 to 1/8†	N.S.	N.R.	N.R.	N.R.
	5/32 and 3/16		F	N.R.	N.R.
	7/32 and 1/4		N.R.	N.R.	N.R.
	5/16 and 3/8		N.R.	N.R.	N.R.
E4520	1/16 to 1/8†	N.S.	N.R.	N.R.	N.R.
	5/32 and 3/16		F	N.R.	N.R.
	7/32 and 1/4		N.R.	N.R.	N.R.
	5/16 and 3/8		N.R.	N.R.	N.R.
E6010	1/16 to 1/8†	dc, reversed	N.R.	N.R.	N.R.
E7010	5/32 and 3/16	polarity (electrode	F	V and OH	V and OH
	7/32 and 1/4	positive)	F	F	H
	5/16 and 3/8		F	F	N.R.
E6011	1/16 to 1/8†	ac, and dc, re-	N.R.	N.R.	N.R.
E7011	5/32 and 3/16	versed polarity	F	V and OH	V and OH
	7/32 and 1/4	(electrode positive)	F	F	H
	5/16 and 3/8		F	F	N.R.
E6012	1/16 to 1/8†	dc, straight	N.R.	N.R.	N.R.
E7012	5/32 and 3/16	polarity	F	V and OH	V and OH
	7/32 and 1/4	(electrode nega-	F	F	H
	5/16 and 3/8	tive) and ac	F	F	N.R.
E6013	1/16 to 1/8†	ac and dc straight	N.R.	N.R.	N.R.
	5/32 and 3/16	polarity	F	V and OH	V and OH
	7/32 and 1/4	(electrode	F	F	H
	5/16 and 3/8	negative)	F	N.R.	N.R.
E6020	1/16 to 1/8†	dc straight polarity	N.R.	N.R.	N.R.
E7020	5/32 and 3/16	(electrode negative)	F	F	H
	7/32 and 1/4	and ac for H-fillets;	F	F	H
	5/16 and 3/8	dc either polarity or ac for flat position welding	F	F	N.R.
E6030	1/16 to 1/8†	dc either	N.R.	N.R.	N.R.
E7030	5/32 and 3/16	polarity	F	F	N.R.
	7/32 and 1/4	and ac	F	F	N.R.
	5/16 and 3/8		F	F	N.R.
E8010	1/16 to 1/8†	dc reversed	N.R.	N.R	N.R.
E9010	5/32 and 3/16	polarity (elec-	F	N.R.	N.R.
E10010	5/32 and 3/16	rode	F	N.R.	N.R.
	5/16 and 3/8	positive)	F	N.R.	N.R.
E8011	1/16 to 1/8†	ac and dc re-	N.R.	N.R.	N.R.
E9011	5/32 and 3/16	versed polarity	F	N.R.	N.R.
E10011	7/32 and 1/4	(electrode positive)	F	N.R.	N.R.
	5/16 and 3/8		F	N.R.	N.R.
E8012	1/16 to 1/8†	ac and dc	N.R.	N.R.	N.R.
E9012	5/32 and 3/16	straight polarity	F	N.R.	N.R.
E10012	7/32 and 1/4	(electrode negative)	F	N.R.	N.R.
	5/16 and 3/8		F	N.R.	N.R.
E8020	1/16 to 1/8†	dc straight po-	N.R.	N.R.	N.R.
E9020	5/32 and 3/16	larity (electrode	F	N.R.	N.R.
E10020	7/32 and 1/4	negative) and ac	F	N.R.	N.R.
	5/16 and 3/8	for H-Fillets dc either polarity and ac for flat position welding	F	N.R.	N.R.
E8030	1/16 to 1/8†	dc either	N.R.	N.R.	N.R.
E9030	5/32 and 3/16	polarity	F	N.R.	N.R.
E10030	7/32 and 1/4	and ac	F	N.R.	N.R.
	5/16 and 3/8		F	N.R.	N.R.

*—For the guided-bend and fillet-weld tests, the steel for the test assembly shall conform to either ASTM A7 or ASTM A70 steels. For testing electrodes of the E6010, E6011, E7010, and E7011 electrodes, one of the plates and backing strip of the guided-bend test assemby, and both plates of the fillet-weld test assembly shall be galvanized after edge preparation with a minimum coating of 2 oz. per sq. ft.

*†—No stress-relieving shall be performed on guided-bend test assemblies or on the specimens removed therefrom.

N.S.—Not specified

N.R.—Not required

NOTWITHSTANDING the extreme pressure of wartime business activities, the joint American Welding Society—American Society for Testing Materials Committee on Filler Metal has issued a complete revision of their specifications for iron and steel arc welding electrodes. Included in the latest set of tentative specifications are tests and procedures designed to plug loopholes in the previous descriptions, thereby still further guiding the small consumer of electrodes in purchasing electrodes suited to specific application needs.

Before undertaking a detailed analysis of new points given in the 1945 specification, two added features deserve mention. First, guided bend requirements have been introduced along with a definite statement that *electrodes classified under one classification shall not be classified under any other classification.* Guided bend tests, fillet weld tests, and the foregoing statement should combine to lift the fog of confusion that existed during 1943 and 1944, when too many electrodes were claimed to meet the requirements of classes E6010, E6011, E6012, and E6013 simultaneously. The letter of the specification was met while the intent of the specification was ignored. Now the 1945 statement and test program should resolve that electrode paradox.

Electrode Classification Scheme

Second, and no less important, is the "Guide to AWS-ASTM Classification of Iron and Steel Arc Welding Electrodes." Here, in a condensed and logical exposition, is found the pattern underlying the electrode classification scheme, along with pertinent data covering chemistry, mechanical properties, coating composition, amperage, and voltage values and important code approvals. The guide gives data parallel to that reported by Harold Lawrence in STEEL, March 6 to April 24, 1944.

This analytical review of the changes made in AWS-ASTM A233 will be divided into two parts: Part I will cover new features of the specification; and Part 2 will discuss the appended guide to electrode classification. Interested

NS FOR Metallic Arc Welding Electrodes

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readers are urged to get copies of the new specification from either of the sponsoring societies.

Electrodes are classified in a related plan combining the ultimate tensile strength of the deposited weld metal with the usability characteristics of the electrodes. Thus the grade number reveals the tensile strength of an all-weld metal 0.505 tensile specimen prepared in a controlled procedure together with a key to the type of current and welding positions established by the coating composition, with a still further subdivision by ductility and penetration factors. The specification and guide combine to make the whole plan exceedingly simple.

A reiteration of the rule specifying single rather than multiple assignment of grade numbers is worthwhile. Although it is true that an E6011 electrode will satisfy all of the physical requirements of the four grades E6010, E6011, E6012 and E6013, certain operating characteristics will be sacrificed if a shop adopts this one type where use for all four conceivably can exist. In this example, simplicity of inventories will be attained at the expense of increased labor and material costs, for E6011 electrodes are slower in many applications than E6012 electrodes, while the E6011 and E6013 grades are more expensive than the E6010 and E6012 types. Cost considerations are explained in detail in the booklet on *Metallic Arc Welding Electrodes* published by STEEL.

In 1943 AWS-ASTM A233 placed a limitation of 0.04 per cent maximum on sulphur, while the new revision removes all restrictions on the deposit chemistry. This move appears to be well taken, as the producers of arc welding electrodes are forced by application considerations to exercise rigid control over the analyses of deposited weld metal. An overall balance of carbon, manganese, phosphorus, sulphur, and silicon is essential to freedom from cracks, porosity and surface holes. Individual elements can be varied according to the ideas of the electrode designer as long as the final combination produces satisfactory weld metal.

Whereas the previous specification permitted classification of electrodes on the primary considerations of tensile strength, ductility and welding positions, modified somewhat by types of current, i.e., alternating or direct current, the new approach retains the old requirements and adds specific usability tests evaluated by the guided-bend and fillet-weld tests.

The guided-bend test uses a hot-dip galvanized coating of 2 oz per sq ft minimum weight for one of the two test pieces and for the backing strip for E6010, E6011, E7010, and E7011 electrodes. By this means, the shallow penetrating electrodes of the E6012, E6013, and E7012 are screened out as the softer arc does not permit proper bonding through the galvanized coating. Particulars of the new requirements are reported in Table I.

The fillet weld test separates electrode groups according to fillet profile among the essentially flat, concave, and convex arrangements.

Test Procedures

All-weld-metal tension test specimens are universally prepared in the flat position. Guided-bend tests for all-position electrodes—remembering that the term "all-position" signifies ability to deposit weld metal in the flat, horizontal fillet, vertical and overhead positions—are mandatory in the vertical and overhead positions for $\frac{5}{32}$-in. and $\frac{5}{16}$-in. diameters. No vertical or overhead welding is recommended with diameters greater than $\frac{5}{16}$-in. The larger diameters of all-position groups and all tested diameters of the flat posi-

TABLE II

REQUIREMENTS FOR PREPARATION OF FILLET WELD TEST ASSEMBLIES

Electrode Classification Number	Diameter, Inches	Thickness (T)	Plate Size Width (W)	Length (L)	Position of Welding	Fillet Size, Inches
E6010	1/16 to 1/8†	N.R.*	..	..	.....	.....
E6011	5/32	1/4	3	12	V and OH	3/16 max.
	3/16	3/8	3	18	V and OH	1/4 max.
E7010	7/32	3/8	3	18	H	5/16 max.
	1/4	1/2	3	18	H	5/16 max.
E7011	5/16 and 3/8	N.R.	..	..	.....	.....
E6012	1/16 to 1/8†	N.R.	..	..	.....	.....
	5/32	1/4	3	12	V and OH	1/4 max.
E7012	3/16	3/8	3	18	V and OH	5/16 max.
	7/32	3/8	3	18	H	1/4 max.
	1/4	1/2	3	18	H	5/16 max.
	5/16 and 3/8	N.R.	..	..	.....	.....
E6013	1/16 to 1/8†	N.R.	..	..	.....	.....
	5/32	1/4	3	12	V and OH	1/4 max.
	3/16	3/8	3	18	V and OH	5/16 max.
	7/32	3/8	3	18	H	1/4 max.
	1/4	1/2	3	18	H	5/16 max.
	5/16 and 3/8	N.R.	..	..	.....	.....
E6020	1/16 to 1/8†	N.R.	..	..	.....	.....
	5/32	3/8	3	18	H	5/32 min.
	3/16	3/8	3	18	H	3/16 min.
E7020	7/32	3/8	3	18	H	1/4 min.
	1/4	1/2	3	18	H	5/16 min.
	5/16 and 3/8	N.R.	..	..	.....	.....
E6030 E7030	N.R.					

†—Inclusive
*N.R.—Not required.

tion groups are evaluated by means of guided bend tests made in flat position.

Fillet-weld tests follow a similar pattern. All position electrodes are examined in the vertical and overhead positions. The 7/32 and ¼-in. diameters of the E6010, E7010, E6011, E7011, E6012, E7012, E6013, E6020, and E7020 classes have to deliver acceptable fillet dimensions in the horizontal fillet position as do the 5/32 and 5/32-in. electrodes of classes E6020 and E7020. The E6030 and E7030 groups, logically enough, have no fillet weld test requirements.

Electrodes of the E80, E90, and E100 series are tested by means of all weld metal tension tests only. Even though these alloy electrodes are used in all positions, following an identification scheme similar to that used with the E60 and E70 groups, no guided bend tests or fillet weld tests have been specified.

Testing Methods Improved

All weld metal tension tests cover the 5/32-in. and larger diameters. The ⅛-in. diameter, which formerly necessitated the use of a sub-size tensile specimen, is no longer subject to tension tests. This is an improved approach towards electrode testing, as the smaller diameters consistently give higher tensile strengths along with quite adequate ductilities. Although the ⅛-in. diameter may be used for work where mechanical properties are quite important, the smaller diameters are often restricted to sheet metal work, where little emphasis is placed on mechanical properties. It is appreciated, of course, that small diameter electrodes are selected for aireraft welding, where physical properties are of paramount importance. Here the excellent record established by the E6013 electrode types, notwithstanding the fact that this group is not generally considered to be a quality class, speaks well for the good balance of tensile strength and ductilities that obtains when light gage metal is joined with suitable small diameter electrodes. No change has been made in the tension test procedure over that used in the preceding specification, other than the elimination of the requirements for the ⅛-in. size.

The guided bend usability test must be carried out with each type of current, where both alternating and direct current are applicable to the electrode class being tested. Likewise with direct current, both polarities must be used for testing when an electrode is claimed to be acceptable with either straight or reverse polarity.

In the guided bend test, the only temperature specification is that the test assembly should be between 60° and 100° F at the time the first pass is started. No limitations are placed upon interpass temperature, as is the case with the tension test procedure.

Bend tests now include side bends, which are designed to evaluate the quality of deposit from 7/32-in. and larger electrodes. The side bends, as is true of the face bends and root bends, are tested in the standard jig familiar to the welding fraternity. All bend tests are made with the weld and plate metal in the as-welded condition. Specifically, this means that no stress relieving is to be done on the welded assembly or on the specimens cut therefrom. Again, as was true of some of the preceding tests, electrodes of 5/32 to ⅛-in. diameters inclusive need not be tested by means of the guided bend test, but instead performance of these sizes shall be considered acceptable, based upon the test results of the 5/32-in. electrodes from the same group.

Fillet weld usability tests have essentially the same requirements as the guided-bend tests, calling for all current and polarity combinations the particular classification is intended to satisfy. In Table II are given completet details for making the fillet weld test assemblies. These include dimensions of the test plates, positions of welding, and sizes of fillet weld.

The fillet weld test is severe because the vertical and horizontal plates are put together in a tight fit. This procedure allows virtually no opportunity for the joint to give and will intentionally be conducive to cracks when the second of the two fillets is deposited.

Complete procedure details state that vertical welding is to be done in an upward direction. This requirement follows normal good practice in the field. To prove the quality of electrodes under test conditions, the first electrode applied in making the fillet weld must be used for its full length, allowing the usual stub end loss of no more than 2 in. Thus, any tendency of electrode performance to deteriorate as the last portion of the electrode is consumed becomes involved in the evaluation. Each electrode used should be burned to as short a stub length as will be allowed by the plate assembly dimensions.

Examination After Sectioning

Another stringent feature of this test is that temperature limitation before welding is begun on the second side. By suggesting room temperature cooling before the second weld is deposited, maximum stress is built up from the first fillet.

Upon completion of the fillet welds, both sides are examined for cracks and other defects. Following this examination, which permits no defects, the assembly is sectioned at a point approximately 1 in. back from the crater end of the deposit made with the first electrode on the first side of the joint. Either face is then polished and etched to ascertain deposit quality. The same specimen is scribed to check the limits on the leg lengths and convexity.

Both legs of the fillet weld must be of

SELECTING WELDING ELECTRODES

Last year, STEEL presented an outstanding series of 14 articles designed to provide a working set of data which may be used as the basis for selecting the best electrode for any particular welding job. Stainless steel, hard surfacing, cast iron, nickel and nickel alloy, copper and copper alloy and aluminum electrodes are covered, along with the usual mild steel types.

These 14 articles have been assembled in a handy booklet and may be obtained at nominal cost by addressing: Engineering Department, STEEL, 1213 West 3rd Street, Cleveland 13, O.

TABLE III

ESSENTIAL DIFFERENCES AMONG BASIC ELECTRODE TYPES

	E6010	E6011	E6012	E6013	E6020-E6030
Welding Positions	All	All	All	All	Flat-Horizontal Fillet
Type of Arc	Deeply penetrating, forceful, spray type	Deeply penetrating, forceful, spray type	Medium penetrating, quiet, slight spatter	Shallow penetrating, quiet, very stable, slight spatter	Medium to deep penetrating, spray type
Type of Slag	Thin, friable, readily removed, may cover incompletely	Thin, friable, readily removed, may cover incompletely	Dense, covers completely	Dense, readily removed	Heavy, honeycombed, covers completely and easily removed.
Fillet Weld Profile	Flat	Flat	Convex	Convex	Flat to Concave
Type of Coating	Cellulosic	Cellulosic	Titania	Titania	Mineral
Weld on Galvanized Steel	Yes	Yes	.....	.....	Yes
X-ray Quality	Good	Good	Poor to Fair	Poor to Good	Excellent
Current	dc only	ac and dc	ac and dc	ac and dc	ac and dc
Polarity	Reverse only	Reverse preferred	Straight preferred	Straight preferred	Straight or Reverse

equal length within $\frac{1}{16}$-in., while the maximum allowable convexity is established for each size of weld. Penetration must reach the junction of the plate edges or extend beyond. No cracking is permitted, while the fillets must be reasonably free from undercut, trapped slag and porosity. The term "reasonably free" is apt to lead to some interpretative difficulties where inspectors and producers find difficulty in setting limits for this terminology. Fortunately, the quality of modern electrodes combined with the high application skills developed in recent years should enable the production of acceptable fillets meeting the spirit of the specification. Re-test is permitted if the first specimen fails. Fillet weld tests are made in the 5/32 to ¼-in. diameters inclusive. No tests are made of either the smaller or larger electrode sizes.

Variations In Dimensions

A change in the permissible variations in dimensions has been effected. Previously, electrodes were required to meet standard lengths plus or minus ⅛-in. The new requirement permits a deviation of plus or minus ¼-in., which is reasonable enough as a difference of ½-in. in electrode lengths, assuming that the maximum variations in lengths occur, will not adversely effect welding performance when the diameter length relationships that are set up are followed.

The former specification stated that the covering shall have sufficient electrical resistance to effectively insulate against a difference of potential of 100 volts. The 1945 discussion of this point adds "60 cycles alternating current."

Considering next the guide to AWS-ASTM classification of iron and steel are welding electrodes, it is learned that this portion of the new specification has been issued as an appendix, consisting of seven parts. Part I is an introduction to the subject, while Parts II to VII inclusive give the primary features of the following grades: E6010, E6011, E6012, E6013, E6020, and E6030.

The details of the introduction to the 1945 specification follow in general the description given in STEEL, March 6, 1944. The introduction explains carefully the need for a complete description of operating characteristics to go hand in hand with the physical property and current data previously used as the keystone on which the classification was built.

Parts II through VII inclusive give essential data supplementing the physical property, current and welding position characteristics described in the specification proper. These salient features are tabulated in Table III to show at a quick glance the essential differences among basic electrode types.

It will be seen that welding positions, type of arc, type of slag, fillet weld profile, type of coating, ability to weld on galvanized steel, X-ray quality, current, and polarity are the indexes to electrode type classification.

In addition to the class name given to the type of coating in Table III, the specifications go on in greater detail to include the primary constituents of the coating, and describe the type of core wire.

The quality of the deposit is explained in relationship to the type of material that may be welded with each class of electrodes. For E6010 electrodes, for example, reference is made to two coating thicknesses that may be used in the $\frac{3}{16}$-in. diameter, although present-day practice has practically adopted one coating thickness for all work. Differentiating performance in the vertical and overhead position from that in the flat and horizontal fillet position, the description of E6010 electrodes points this out by stating that the larger volume of $\frac{3}{16}$-in. E6010 electrodes are produced with the thinner coating.

Each part gives suggested ranges of current and voltage. Although the ranges presented are narrower than those found in previous literature, they may be too broad for work of the very highest caliber.

Detailed Specifications Listed

The specification proper lists the desired physical properties of the deposited weld metal, while the appendix outlines for each type the anticipated tensile strength, yield strength, elongation, reduction of area, impact resistance, endurance limit, density, and brinell hardness.

A description of the chemical analysis of deposit is given in the appendix, since no chemical requirements now are shown in the specification itself.

Included with each summary of specific electrode classes is a comprehensive list of specification and code approvals. To make this information available in a more convenient form, such approvals are tabulated in Table IV.

The American Welding Society and the American Society for Testing Materials deserve congratulations for writing a good clean-cut specification for mild steel and low alloy electrodes. In a sense, this is a purchaser's specification in that it permits the consumers of electrodes to make quite rigid and complete demands upon the manufacturers. The comprehensive test program outlined might put a burden on a producer of electrodes if he were not regularly engaged in checking the quality of his product. If the new specification and appendix are used intelligently, purchase of any specific grade assures the consumer of getting precisely the type of welding performance he desires.

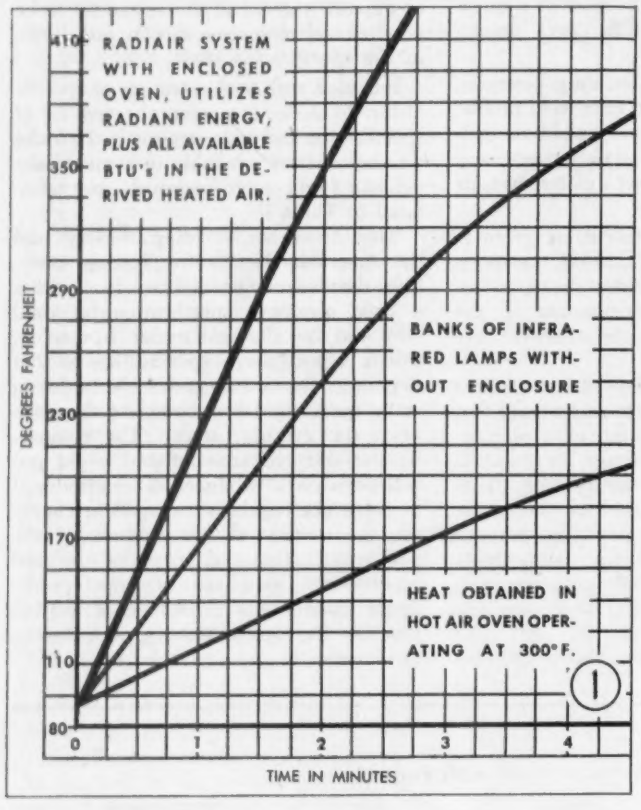
TABLE IV

SPECIFICATION APPROVALS FOR MILD STEEL ELECTRODES

Specification	E6010	E6011	E6012	E6013	E6020-E6030
1. U. S. Army	57-203 Type I, Class A		57-203 Type I, Class B		57-203 Type I, Class C
2. Army Navy Aeronautical	AN-E-9, Class B		AN-E-9, Class A	AN-E, Class A	
3. American Bureau of Shipping	Approved	Approved	Approved with certain exceptions	Approved with certain exceptions	Approved
4. API-ASME Code for Unfired Pressure Vessels	W-520	W-520			W-520
5. ASME Code for Unfired Pressure Vessels	U68, U69, U70	U68, U69, U70	U69, U70	U69, U70	U68, U69, U70
6. Navy Dept. Bureau	46E3 (Int) Grade I Classes 1, 2, 3	46E3 (Int) Grade III Classes 1, 2, 3			46E3 (Int)* Grade II, Classes 2, 3
7. Hartford Steam Boiler Inspection and Insurance Co.	Approved	Approved			Approved
8 Lloyd's Register of Shipping	Section 4 Paragraphs 1 and 9	Section 4 Paragraphs 1 and 9	Section 4 Paragraphs 1 to 8, incl.	Section 4 Paragraphs 1 to 8, incl.	Section 4 Paragraphs 1 and 9
9. U. S. Coast Guard	Approved	Approved	Approved with certain exceptions	Approved with certain exceptions	Approved
10. British Corporation Register of Shipping and Aircraft	Approved	Approved	Approved	Approved	Approved
11. Building Codes of New York City, Pittsburgh, and many other municipalities	Approved	Approved	Approved	Approved	Approved

*E6030 does not meet Class 2

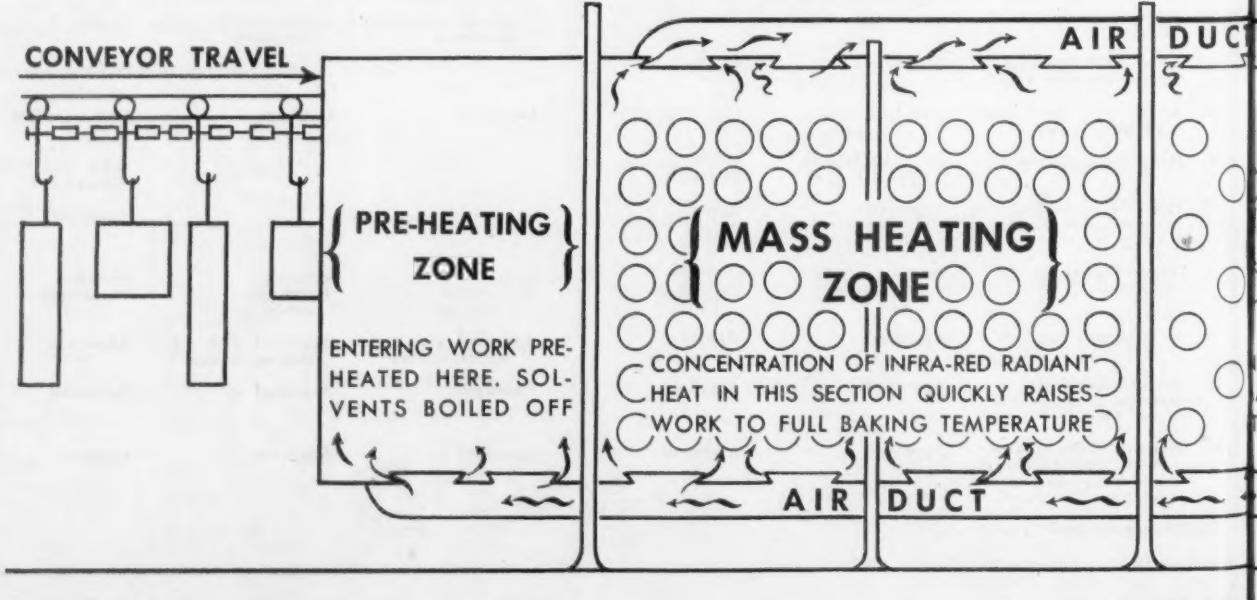
How to Get the Most from... INFRA-RED HEATING— DRYING- BAKING-



Properly applied, infra-red lamp equipment affords important advantages in speed and economy in baking finishes on metal parts; in drying them after cleaning, plating or other operations; in heating them for expanding for easy assembly and proper fit. Future of infra-red lies in realm of lower operating costs. Power consumption on one paint baking job was reduced from 600 to 278 kw, indicating possibilities in expanding range of application by cutting operating costs. Another installation triples output, saves $2880 monthly in floor space released for other operations in the plant

By G. W. BIRDSALL
Associate Editor, STEEL

MULTIPLE ZONED INFRARE



ECONOMIES of infra-red radiant heating vs. other heating systems cannot be made apparent on a basis of swappings Btu's. The user of a properly engineered infra-red installation will find that advantages making it a real cost-saver include greatly increased production; lower equipment, installation and maintenance costs; greater flexibility and ease of control; reduced rejects; smaller space requirements; added safety and cleanliness, points out T. P. Cusack Jr., manager of the Radiant Heat Division, C. M. Hall Lamp Co., Detroit. He emphasizes that the difference between low and high costs depends upon the correct engineering approach to the application of infra-red heat, which he proceeds to explain as follows:

The wide publicity attending the success of some of the first infra-red heating applications for drying and baking paint in the automobile industry gave many prospective users the impression that all that was required was to obtain a number of infra-red lamps and reflectors, mount them on a rack and put the work to be baked between two such panels or racks. While an arrangement of this type unquestionably often fulfilled the requirements of the job at hand, as far as heating was concerned, the results were not all that would be desired and were frequently inconsistent due to varying operating conditions.

Such wrong impressions have done much to limit unduly the growth and application of infra-red heating. Because it was not thoroughly understood when first utilized, infra-red heating was believed to produce high speeds in drying and baking finishes on metal parts by heating from the "inside out". Investigations have now proved this conception of infra-red heating to be erroneous.

Instead of requiring an entirely different and separate oven for each kind of article to be heated, Mr. Cusack points out that thin and thick parts of different sizes and shapes, light and dark colored finishes and different metals can all be handled in the same unit when properly engineered.

But before investigating these and other factors affecting efficiency and operating costs, let's first see what infra-red is and how it works.

Infra-Red Is Heat: Instead of infra-red heating possessing some "magic" quality that makes it different from other methods of heating, actually it is a simple and easily understood method of delivering Btu's to the work.

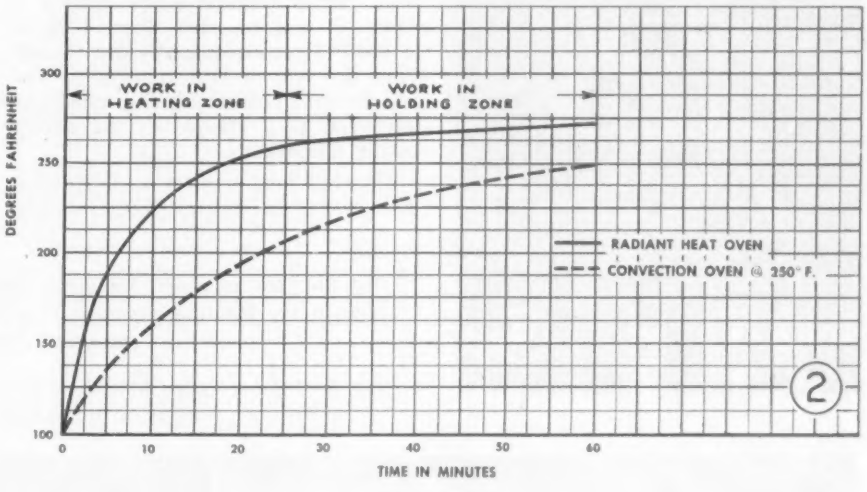
Infra-red lamps are a special type, designed so that most of their energy output is in the infra-red region of the spectrum, just below that of visible light. While light also is produced by an infra-red lamp, the largest proportion of energy output is in the form of radiant heat. Of course, no physical heat is produced until the radiant energy strikes a surface that absorbs it. To use such lamps efficiently, it is necessary to understand the mechanics of heating.

There are three principal methods of transferring heat. CONDUCTION: Here molecular activity transmits the heat energy through a given mass at a given rate characteristic of the particular material. CONVECTION: In this case, the heat is transferred by a moving medium such as air, water or steam. RADIATION: Here the heat travels in wave-like emanations through space in

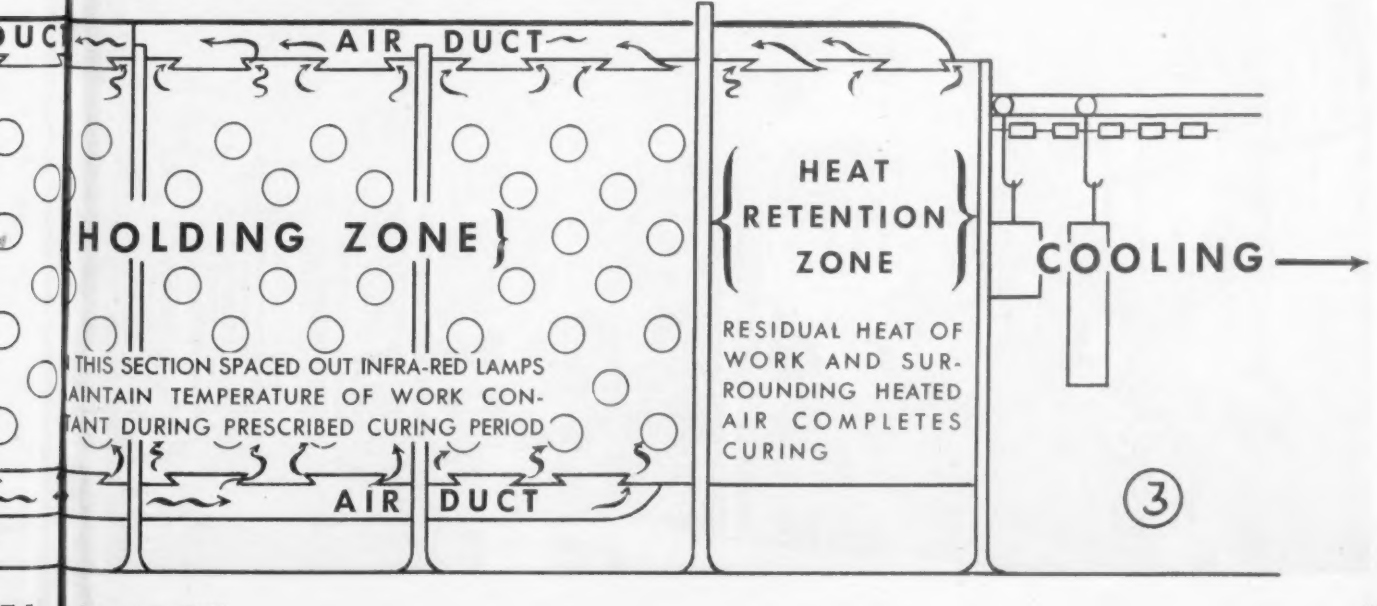
Fig. 1—Comparison of rates of heating a 0.095-in. thick steel panel show speed of open type banks of infra-red units and still greater speed when properly enclosed by a housing

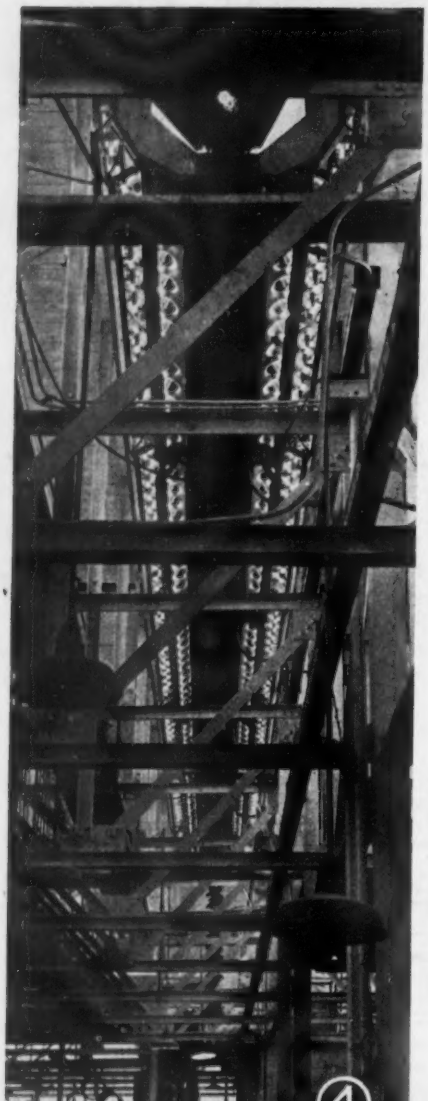
Fig. 2—Demonstrating how "heating" and "holding" divide baking job into two parts in a radiant oven. Curves also show how same overall heating effect, same area under the curve, can be obtained so rapidly by infra-red

Fig. 3—Typical 4-zone infra-red oven for baking normal synthetic enamel finishes



FRED HEATING SYSTEM





much the same manner as visible light or magnetic forces. In correctly designed infra-red equipment, each of these methods of heat transfer must be scientifically accounted for, since all three are involved in varying degrees in any heating problem and thus affect heating efficiency.

Why Infra-Red Is Fast: Rate of heat transfer—whether by conduction, convection or radiation—depends upon the difference in temperature between the heat source and the work. In a conventional convection oven, the work is heated by air which may be only a few degrees hotter than the desired temperature of the work. Result is that as the work comes up to temperature, the rate of heat transfer slows down and practically stops as work reaches air temperature.

For this reason, a considerable period of time is usually required in a convection oven for baking metal finishes, several hours not being uncommon.

On the other hand, when heating with infra-red, the heat source is several thousand degrees hotter than the work, even after the work has reached ordinary baking temperatures of 200-300° F since carbon filament lamps operate at 3140° F and tungsten filament lamps at 4040° F, as explained by Mr. Cusack. Thus the rate of heat transfer is fast and the work continues to be heated rapidly even as it approaches the desired baking temperature.

This fast heat transfer is obtained in both batch type radiant ovens and conveyorized radiant heating systems. It is this inherently rapid rate of heat transfer that accounts for the unusual high outputs of work obtained in properly engineered radiant heating installations.

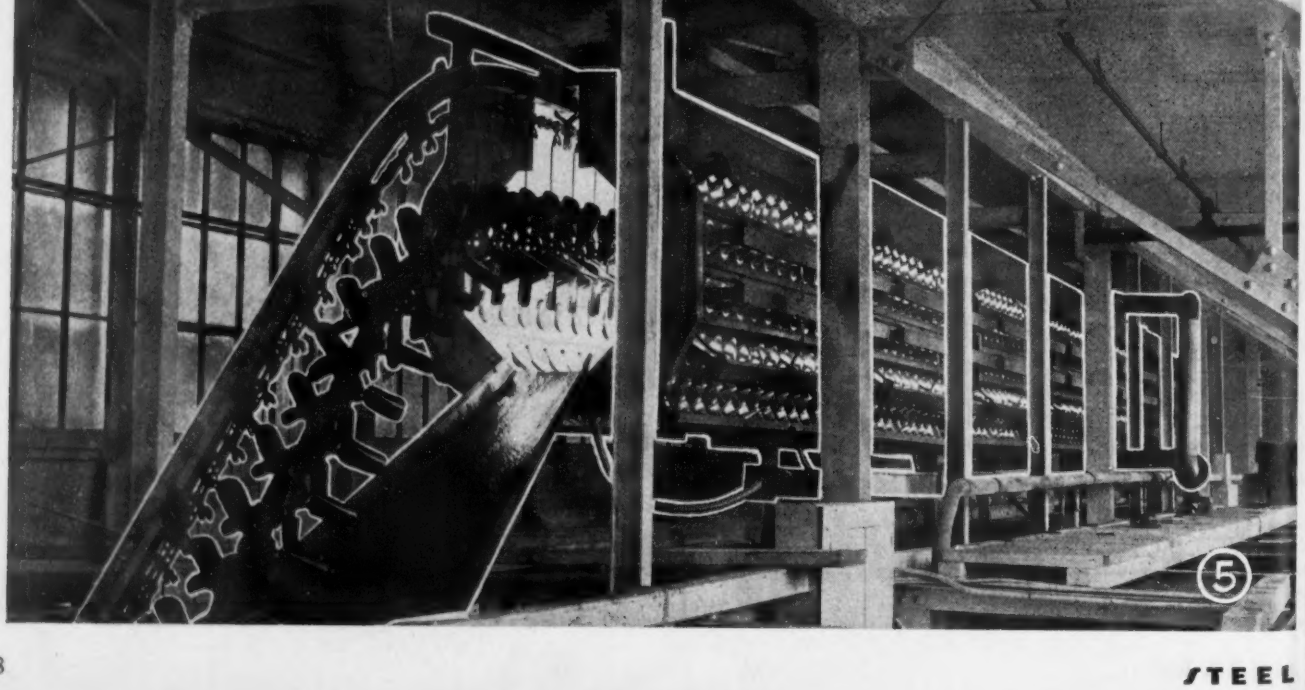
At the same time there are certain phases of heat engineering that must be understood and applied for proper utilization of infra-red heating, Mr. Cusack points out. The first principle is that heat is developed at the point where the radiant energy is intercepted, that is, at the work surface. This heat, in turn, is then conducted through the mass of the part being heated.

For efficient operation every reasonable method should be utilized to prevent loss of surface heat. Certainly a large proportion of this surface heat is lost when work is hung between two open banks of infra-red lamps, because the hot work surface heats surrounding air. Not being confined, the heated air rises, creating natural convection currents that conduct a great number of precious Btu's away from the work.

"Right here is the opportunity to increase the efficiency of an infra-red system," says Mr. Cusack, who adds, "In a properly engineered installation, the air surrounding the work can be kept at or near the desired work temperature by enclosing the entire system in a housing which prevents loss of valuable heated air. Such an enclosure increases overall operating efficiency as much as 50 per cent. The importance of maintaining properly elevated air temperatures in radiant heating ovens thus becomes ap-

Fig. 4—View of Hayes Industries infra-red oven shows how it was mounted high in the building structure, thus saves $2880 monthly in floor space; at same time, output was tripled

Fig. 5—Infra-red oven is outlined here to show how it was fitted into structural framework of the building at Hayes Industries



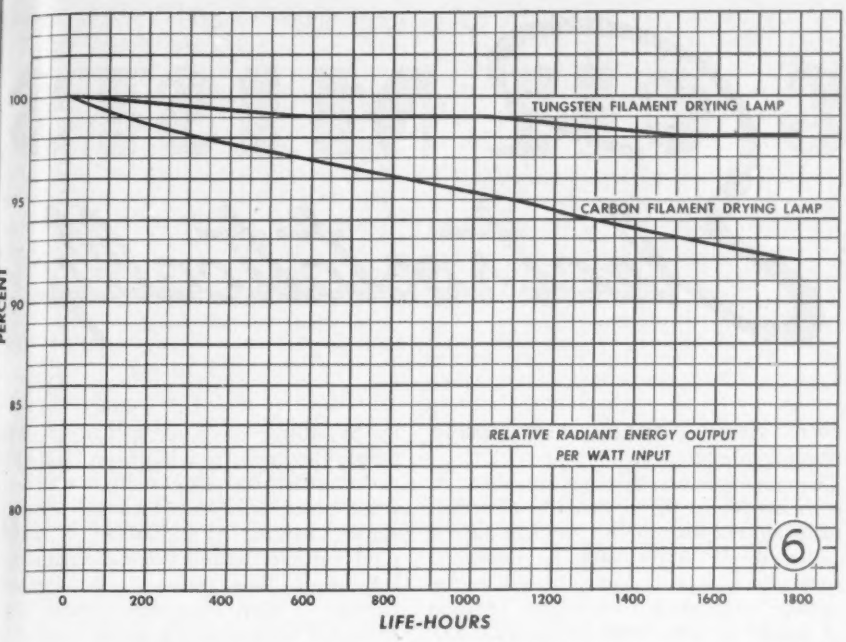


Fig. 6—Per cent efficiency (ratio of energy output to input) for tungsten and carbon filament lamps. These curves show why tungsten lamps are preferred by many engineers

Fig. 7—Dip tank, too, is mounted overhead in the building structure as shown here. Conveyor line carries work through tank

parent." Fig. 1 illustrates the advantage of infra-red oven enclosures.

Such an oven enclosure will result in the heated air rising to the top and being trapped there, cause stratification (cool air at bottom, warm air in center, hot air at top). This in turn causes uneven heating, so stratification must be prevented by proper circulation of the air within the oven—exhausting air at the top and returning it at the bottom through ductwork to get uniform distribution. One such change of air per minute will up oven efficiency 15 per cent, reports Mr. Cusack.

Yet merely preventing loss of heated air will not insure efficient drying, for heat alone will not do the job. Some means must be provided to take out the solvent vapors which otherwise would saturate the oven atmosphere and prevent drying. This is done by continuously exhausting a certain percentage of the air recirculated in the oven and replacing it with clean air.

Multiple Zone Ovens: Most economical use of radiant energy involves at least two zones—a heating zone and a holding zone. These are inherently separate sections because the work to be done in them is different. In the first zone the job is essentially a mass heating operation bringing the mass up to the desired temperature. In the second zone, infra-red energy is applied to the work in sufficient concentration to maintain the temperature developed in the mass heating operation. Thus, the first zone is mainly a heating section; the second, a holding section.

Fig. 2 illustrates diagrammatically these two different operations and how they are done in a radiant energy oven in comparison with a convection oven. It is evident that the same paint baking conditions (same area under the curve) are obtained with infra-red in a fraction of the time, simply because required work temperatures are reached sooner.

Therefore to reduce costs, a well engineered continuous conveyor type oven will employ at least two zones (1) a mass heating zone where lamps are closely spaced together and (2) the holding zone where the lamps are spaced farther apart . . . and many units are designed with four zones as illustrated in Fig. 3.

In a typical 4-zone oven for baking normal synthetic enamel, see Fig. 3, the first or entering section is a preheating zone utilizing hot exhaust air. No infra-red lamps are used in this portion of the oven. Preheating zone fills a two-fold purpose — preheating entering work, thereby increasing overall thermal efficiency; and boiling off the highly volatile solvents.

Next, entering the mass heating zone with its concentration of infra-red lamps quickly raises work to full baking temperature. In third or holding zone, spacing out the lamps maintains temperature of work constant during prescribed curing period while heat is distributed by conduction throughout the entire mass of the parts being finished.

In the fourth or heat retention zone, no lamps are employed and the residual heat of the work and surrounding heated air completes the curing of the finish. Into this fourth zone is added the make-up air which is warmed by the residual heat of the work. Circulation of air through such a system is also diagrammed in Fig. 3.

Zone arrangement can be modified as required. For example, in the baking of certain wrinkle finishes the low-heat zone comes ahead of the high-heat zone, just the reverse of that in Fig. 3.

Since the length of time the work remains in any particular zone is a function of the conveyor speed and length of that zone, it is easy to design an infra-red oven for almost any heating cycle required.

Proper Design Cuts Operating Costs: There are a number of important factors entering into the design of a radiant oven in addition to those already mentioned (enclosure, recirculation, ventilation, zoning, proper heat cycle, etc.). It is vital that the influence of every factor entering into the efficiency of the installation be understood if the energy consumed is to be utilized to the greatest advantage. Proper consideration and balancing of these various factors has made possible some remarkable economies.

As an example of what can be achieved, one job originally estimated to consume 600 kw, through skillful engineering actually was made to operate at a power consumption of only 278 kw. That is what is meant in the previous reference to the fact that the future of infra-red depends upon the economies which can be effected by proper infra-red engineering and design. It's that kind of economies to which Mr. Cusack refers.

Infra-Red Source: Mr. Cusack pre-

(*Please turn to Page* 148)

COLLECTING OIL MISTS Electrostatically

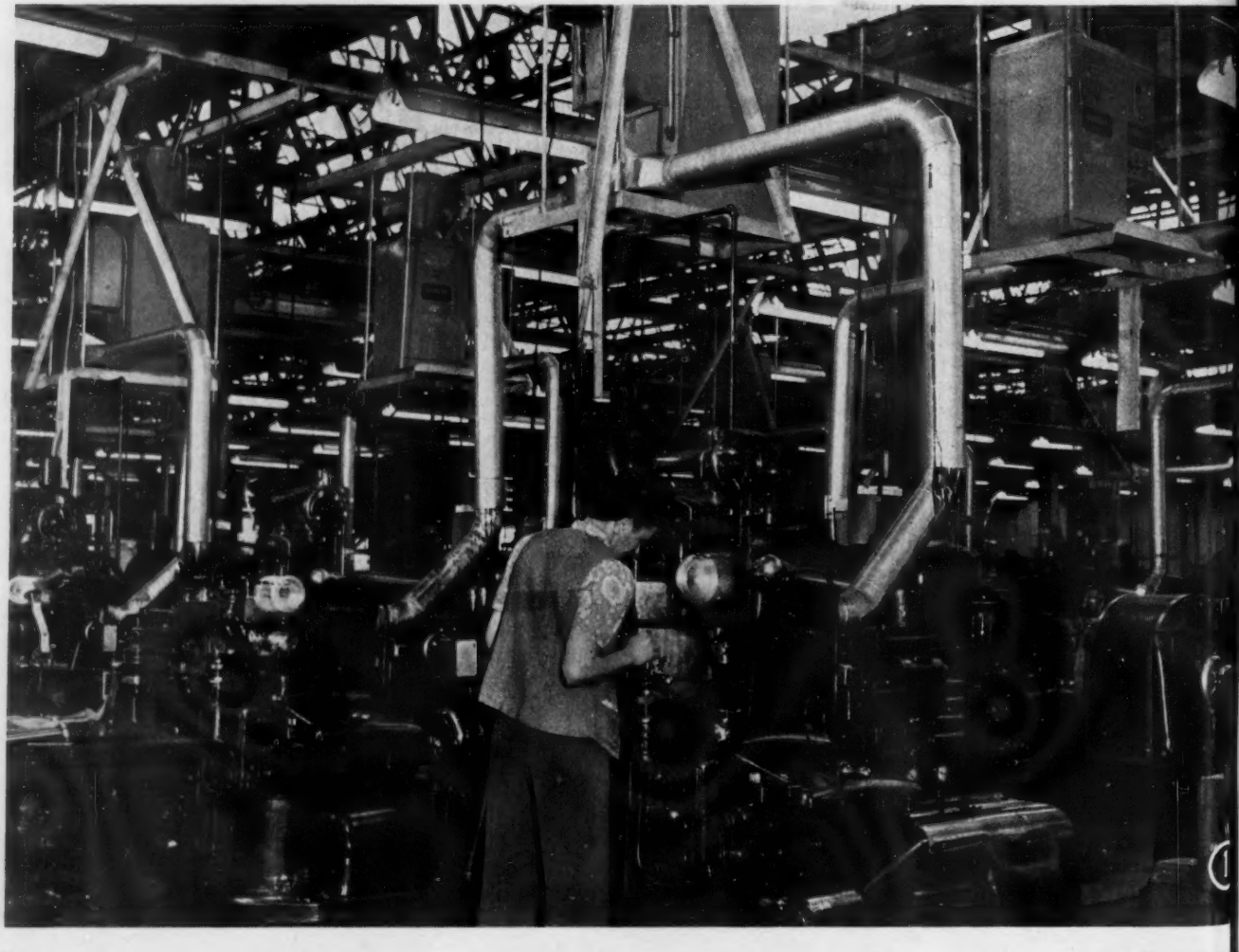
By A. H. ALLEN
Detroit Editor, STEEL

OIL smoke and mist arising from closely-packed batteries of high-speed grinding machines, such as thread grinders and gear grinders, can prove to be both a nuisance and distinct maintenance hazard.

The fine mist, resulting from the breaking up of particles of cutting oil, rises from machines and settles on overhead lighting equipment, roof trusses, bus ducts and other equipment, and at the same time fogs the surrounding atmosphere, often contributing to unpleasant working conditions.

Simple exhaust systems attached to such machines, while partially effective, really do not answer the problem, as the collected oil fumes must be deposited somewhere, and if merely blown to the outside, may bring complaints. Dilution of inside air with large volumes of outside air likewise is not satisfactory, because of the expense involved in blowing equipment as well as in heat loss in winter, plus the fact outside air itself is usually contaminated to a degree in industrial districts.

One solution which has been tried and found suitable is the installation of Precipitrons in exhaust ducts leading from machines where oil mists originate. Although it was developed some years ago by Westinghouse Electric Corp., Pittsburgh, the Precipitron has been limited in its industrial use. Essentially it is a two-stage precipitator in which the electrostatic charging precipitating of small solid particles in the exhaust stream are combined. The exhaust first passes through a high local electrostatic field produced by impressing direct current at 13,000 v on a number of fine wires. This serves to charge or ionize the solid particles which then pass to a nondischarging uniform electrostatic field, created by a system of parallel steel plates, alternate plates being grounded, and the remaining plates being connected to a source of 6000v dc potential. There the particles are drawn to the electrodes of opposite polarity and removed from the air stream which is then exhausted



rom the top of the Precipitron unit back o the room atmosphere.

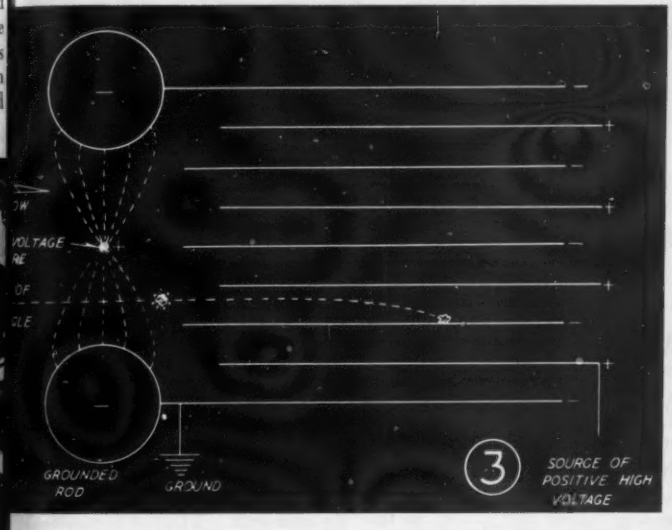
The unit itself comprises two principal lements — an ionizer - collector cell nd a power pack. The cell is an all-metal unit capable of cleaning 600 fpm t 90 per cent efficiency, according to he manufacturer. The power pack con-ains transformers, rectifier tubes, capac-tor, protective current limiting resistors nd indicating system to signal a short ircuit. The latter unit converts 115 v ac rom plant lines to the necessary high oltage direct current for charging the lectrodes of the collector cell.

Size of particles in oil mists, dusts, smoke and the like is measured by a unit known as the micron, equivalent to one-thousandth of a millimeter, or 0.00004-in. Miscellaneous dusts, pollen and other particles larger than 1 micron in size tend to settle from the air unless it is in motion. Some heavy industrial dusts average 8000 microns in particle size, while tobacco smoke particles are as small as 0.1-micron. A 10-micron particle is about the smallest which can be seen by the naked eye.

Mechanical filters are reported effective in removing dirt particles from 5 microns up in size, but the electrostatic method will precipitate the smaller particles. The principle of the method has been known for many years and has been applied successfully in such instances as boiler stacks, smelters and cement mills, where the Cottrell precipitator is commonly used. This equipment employs voltages of from 30,000 to 100,000 and generates a high degree of ozone, making the air around them unfit for breathing. By reducing the voltage as in the case of the precipitron — 13,000 for ionization and 6000 for

Fig. 4—Cutaway view of electrostatic dust precipitator, showing main ionizer-collector cell through which exhaust stream passes, and power pack at right to charge the collector

Fig. 3—Diagrammatic representation of how dust particles are given positive charge and then attracted to negatively charged collector plates



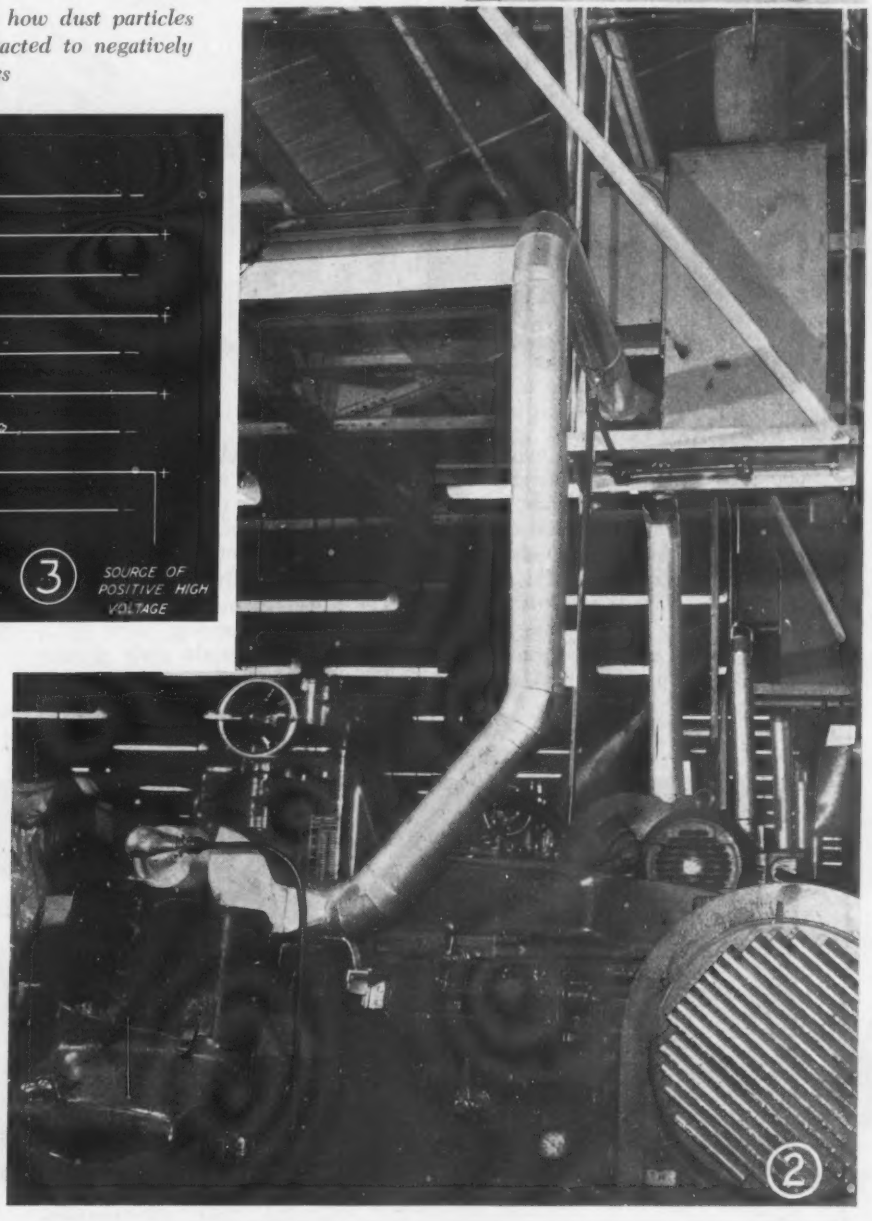


Fig. 1—Battery of gear grinders, with Precipitron units mounted overhead, each collector serving two grinders

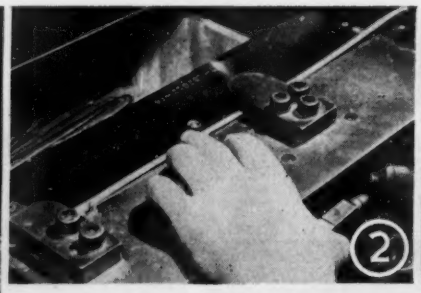
Fig. 2—Closeup of 6-in. duct system from collector to grinding, with inlet positioned close to grinding wheel to catch all fumes and particles. Motor and exhaust fan are mounted on top of collector unit

collection — the objectionable features of ozone generation are overcome.

As installed on Pratt & Whitney gear grinders at the Gear and Axle Division of Chevrolet Motor Division in Detroit, the Precipitrons are mounted on overhead supports as shown in an accompanying illustration, one unit serving two grinders. Intake ports of 6-in. exhaust ducts, covered with a grille, are located as close to the grinding wheel as is practical, the ducts themselves leading to the base of the Precipitron unit mounted above. A small axial flow exhaust fan is mounted atop the collection unit, drawing exhaust fumes from the vicinity of the grinding wheels up through the ducts and into the collection chamber. Since dust and dirt particles are covered with oil, they drain off the collection plates into a sump at the base of this equipment, from which a return pipe carries the liquid to the oil reservoirs on the respective grinders.

Chevrolet plant engineers have found the electrostatic collection method of mist collection a valuable maintenance tool. Directly over grinders without collection equipment, rising mists condense on roof trusses, necessitating frequent cleaning to avoid dripping down on to operators, machines and work in process. In time, it is believed the original cost of the unit, around $300 each, exclusive of duct systems, would be made up by maintenance savings. Casual observation of the air surrounding the batteries of grinding machines shows a considerably greater clarity than around machines not equipped with collectors. This should at least be conducive to better working conditions, although to date there has been little reaction from machine operators as to their own feeling with regard to the efficacy of the Precipitron equipment.

Chevrolet engineers indicate, however, that in future layouts of batteries of equipment of this type, they would be favorably disposed toward installation of the auxiliary equipment. One improvement, which machine tool builders might consider, would be the incorporation of intake ports for the duct system into the design of machines, so that they could be located more closely to the source of oil mists, or where the wheel contact is admittedly makeshift, there is some escape of mist from the region of the exhaust ducts.

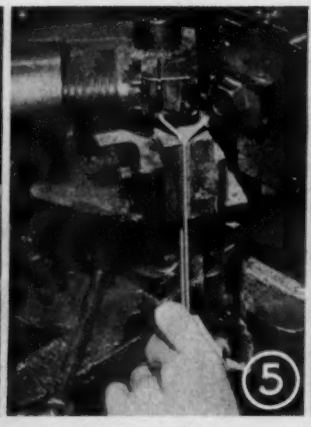


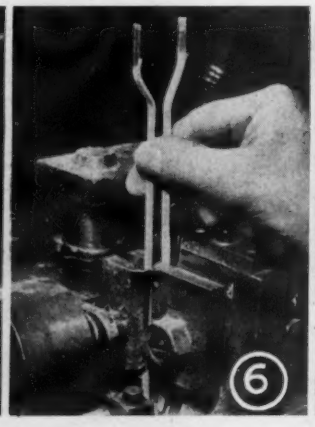
Ingenious Jigs, Semiautomatic Machines Used for

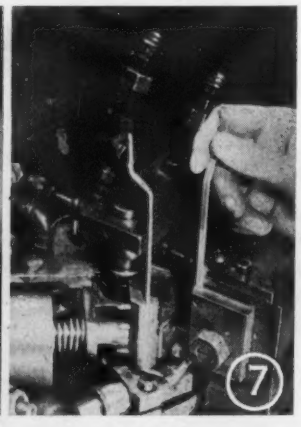
Forming Aircraft Coils

SINCE Pearl Harbor, over 6,000,000 coils for aircraft generators have been precision formed on specially developed, semiautomatic machines such as the one shown in the accompanying illustrations. This production has been made possible at Westinghouse Corp.'s Lima, Ohio, works by ingenious jigs and mechanisms such as those shown in Fig. 1. A coil starts out as a straight piece of copper, slightly larger in cross-section than a paper book match and insulated with glass fiber to withstand high temperatures. Four forming operations later it is ready for the armature. These operations, made possible by interlocked sequencing, involve:

Bending a straight piece of copper, Fig. 2, into a hairpin shaped coil, Fig. 3; forming the front end of this hairpin, Fig. 4, to fit the commutator slots, Fig. 5; forming the rear end of this hairpin, Fig. 6, to fit the rotor slots, Fig. 7; and bending the front end of the bottom coil side up to a point that is level with the front end of the top coil side. Thus it is possible to place the ends side by side in the commutator slot for brazing.







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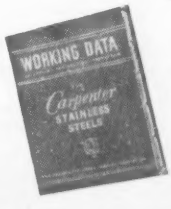

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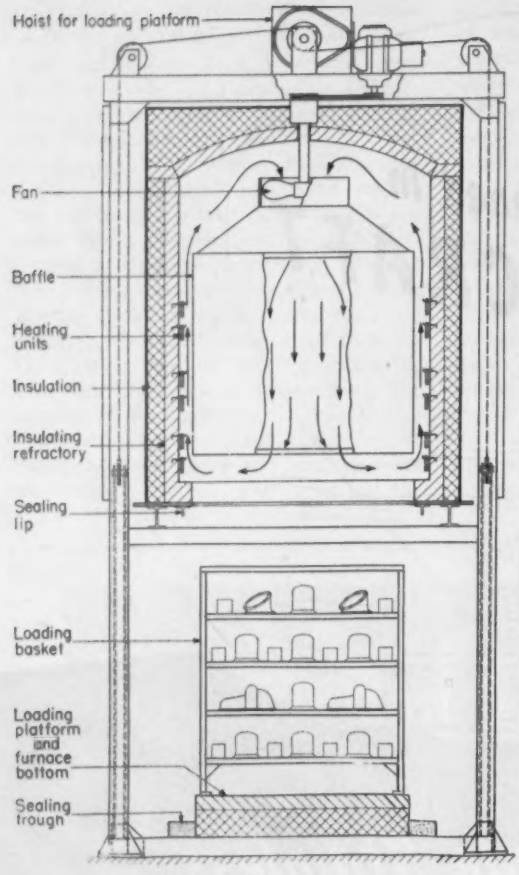

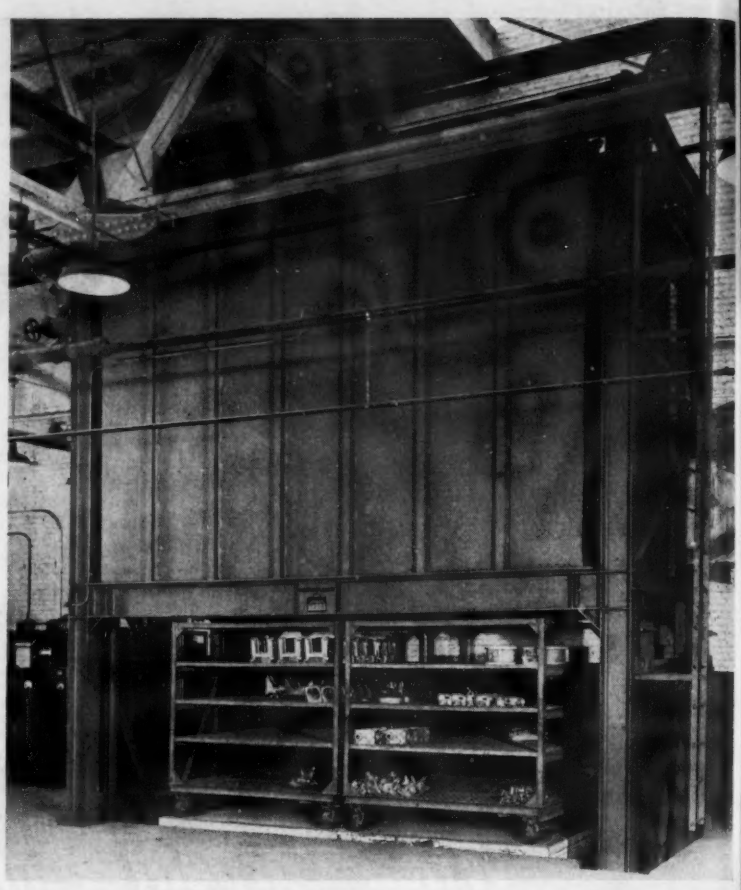

Heat Treating Magnesium Alloys

Elevator-type furnace holds temperatures within narrow range and produces parts with maximum physicals obtainable

MAGNESIUM alloys of aluminum and zinc being produced as castings for various structural parts of airplanes are important in keeping down dead weight and in increasing the useful load of aircraft.

To obtain their favorable weight ratios, it is necessary to double heat-treat the magnesium alloys. Such heat treatments require temperature regulation within plus or minus 5°F, and castings must be shielded from radiant heat so that thin sections of the alloys are not overheated. In addition, the inflammability of magnesium alloys necessitates the use of heat-treating furnaces that are equipped not only with suitable safety devices, but are so designed that they can withstand a magnesium fire in their interiors without appreciable damage to the furnace, and with complete safety to the building in which the furnaces are located.

Approximately 3 years ago, before the present large-scale production began, requirements of magnesium-alloy heat treatment were studied by the General Electric Co., Schenectady, N. Y. As a result, an elevator-type magnesium-alloy heat-treating furnace was developed. The cross-section of a typical furnace, shown at left above, shows how large-volume fans flood working space of the furnace with hot atmosphere, thus insuring good temperature uniformity. The baffle which surrounds the working space serves not only to direct the air flow, but also to shield the alloy from direct radiant heat. Maximum operating temperature is 800°F.

TIME-TEMPERATURE EXPLORATION TEST

Time	Thermocouple 1	Thermocouple 2	Thermocouple 3
6:00 p.m.—Solution Heat on			
8:00	500	500	502
9:00	693	603	698
At Heat			
10:00	766	764	766
Midnight	762	762	762
2:00 a.m	766	766	766
4:00	766	766	766
6:00	766	766	766
8:00	766	766	766
Noon	764	764	764
2:00 p.m.	764	764	764
4:00	Heat Off		

Alloys to be treated are placed on racks like those shown at right above. This furnace has its loading platform with two partially lowered racks in lowered position. The racks are placed on the movable furnace bottom, which, when raised, puts the loaded rack into position in the stream of circulating atmosphere. The furnace bottom is sealed tightly to the furnace, permitting a protective atmosphere of sulphur-dioxide to be maintained within to inhibit fires and oxidation of casting surfaces. A refractory lining and the tight seal of the furnace restrict any fire that may occur in the interior of the furnace.

An excerpt from a temperature-exploration test conducted by a magnesium foundry is shown in the accompanying table. Thermocouples were located at top, center and bottom of charge. Results indicate relative efficiency of this type of furnace. Experience in numerous other installations indicates that the electrically-heated, atmosphere-circulating elevator furnace provides accuracy and safety which are essential in mass production of magnesium-alloy castings.

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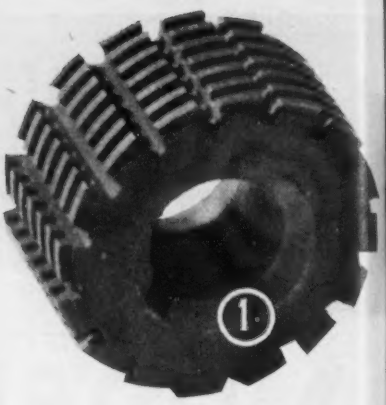
Avoiding Decarburization in Heat Treating

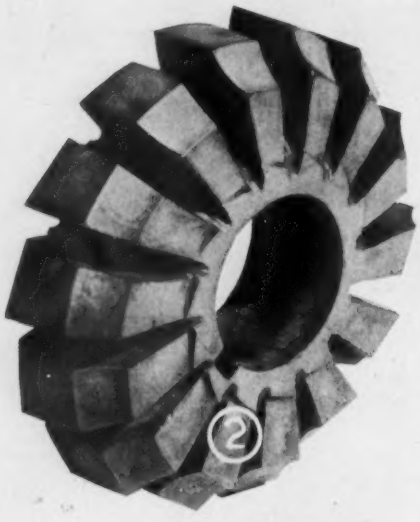
High Speed Steel Tools



HIGH-SPEED steel tools of all types—tungsten, molybdenum or cobalt — now are being heat-treated in production electric furnaces by General Electric Co., Schenectady, N. Y. No surface change occurs except a slight discoloration which becomes apparent when the tool is transferred from furnace to quench bath.

By this method, cutters of all types are made uniformly hard to the sharpest point. A testing file, even when applied with force, will not remove the point or notch the cutting edge. All cutting and grinding, usually necessary to remove oxidation or decarburization, are eliminated. Cutters and dies can be made to size before hardening with a resultant saving in material and grinding cost.

Furnaces and atmosphere producers, such as those shown in Fig. 4, afford very satisfactory results. The G-E types T and TG box furnaces are at left, and a drycolene producer is at right. Among the steel tools heat treated in these units are the cutters shown in Figs. 1, 2 and 3.



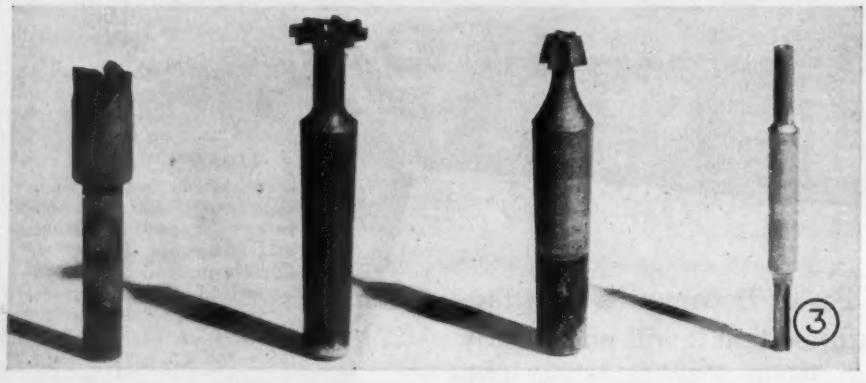


Fig. 2 shows a form-milling cutter, with clean, sharp edges, which was heat-treated in the type TG furnace with drycolene atmosphere. A square-thread milling cutter, heat treated in a TG furnace without decarburization or oxidation, is shown in Fig. 1. In Fig. 3, four typical cutters made of high-speed steels, heat treated in a type TG furnace with protective atmosphere of drycolene, show clean surface, but their cutting edges and corners are file-hard.

The foregoing results are made possible if conditions listed below exist.

1. If preheat and high-heat furnaces are gas-tight electric furnaces.
2. If atmosphere in the furnace protecting the steel against oxidation is practically free from the decarburizing gases, carbon dioxide, and water vapor.
3. If flame curtain is completely effective in keeping air out of the furnace when door is open, and yet is not so located or not so violent as to fill the heating chamber with its products of combustion.
4. If furnace atmosphere is enriched slightly (usually with natural gas, propane or butane), to compensate for contamination of the atmosphere with carbon dioxide and water during the charging and discharging of the furnace.

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The head on a Walker-Turner Radial Drill tilts to 45° in either direction. No need for angle vises and special set-ups in drilling, reaming and tapping angled holes. It speeds output, lowers production costs, improves machining flexibility.

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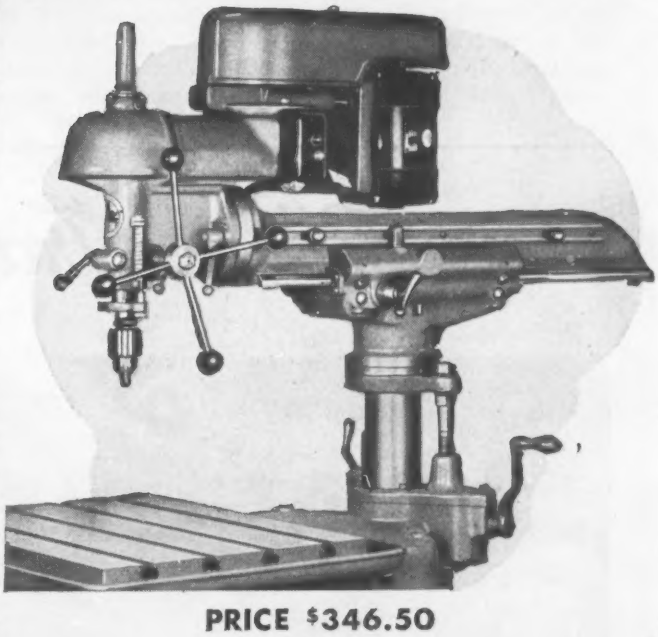

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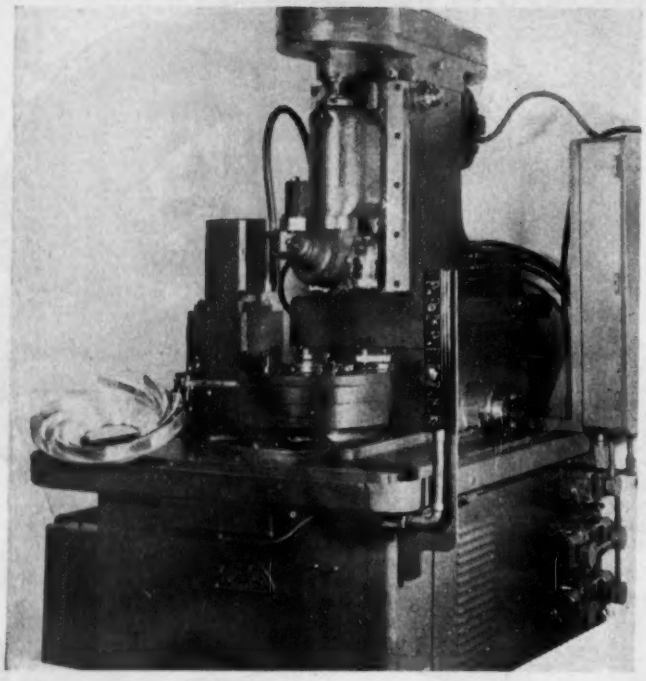


Profile Milling

Three consecutive operations on aircraft diffuser part expedite production and reduce to minimum costly hand-finishing operations formerly required

PROFILE millers for three consecutive operations on an aircraft diffuser part expedite production and reduce to a minimum the time-consuming and costly hand-finishing operations which would be necessary in conventional handling. The three special units used in this operation are made by Snyder Tool & Engineering Co., Detroit.

In the first operation a vertical 2-spindle end-milling machine is used to mill a 1/32-in. radius on each end of the nine diffuser vanes. Part is located and clamped on a 9-station Geneva index table. On each individual cycle, one vane is machined on both ends, nine cycles finishing this operation. The end mills used are installed on eccentrically mounted quill housing which rotates through 180 degrees.

The 2-spindle head, motor and spindle drive mechanism slide into position hydraulically and are supported by two guide bars.

In the second operation, shown in illustration, a vertical single-spindle miller is used to mill the outside contour of the vanes with side milling cutters set at an angle to the vertical spindle housing center line.

In addition to the three feeding motions—feeding the cutter down, moving the entire slide in and out and rotating the table at feed rate—it also is necessary to keep the cutting edge of the milling cutters tangent to various radii which make the contour of the vane. Therefore, the spindle housing is rotated angularly to correspond to the in-and-out movement of the main slide. The mechanism shown at the left of the cutter housing performs this function.

In the third operation a single-spindle vertical end miller is used to mill the inside contour of the vanes. After rapid advance into the work, the single-spindle housing is raised by a cam mechanism to conform to the vane contour.

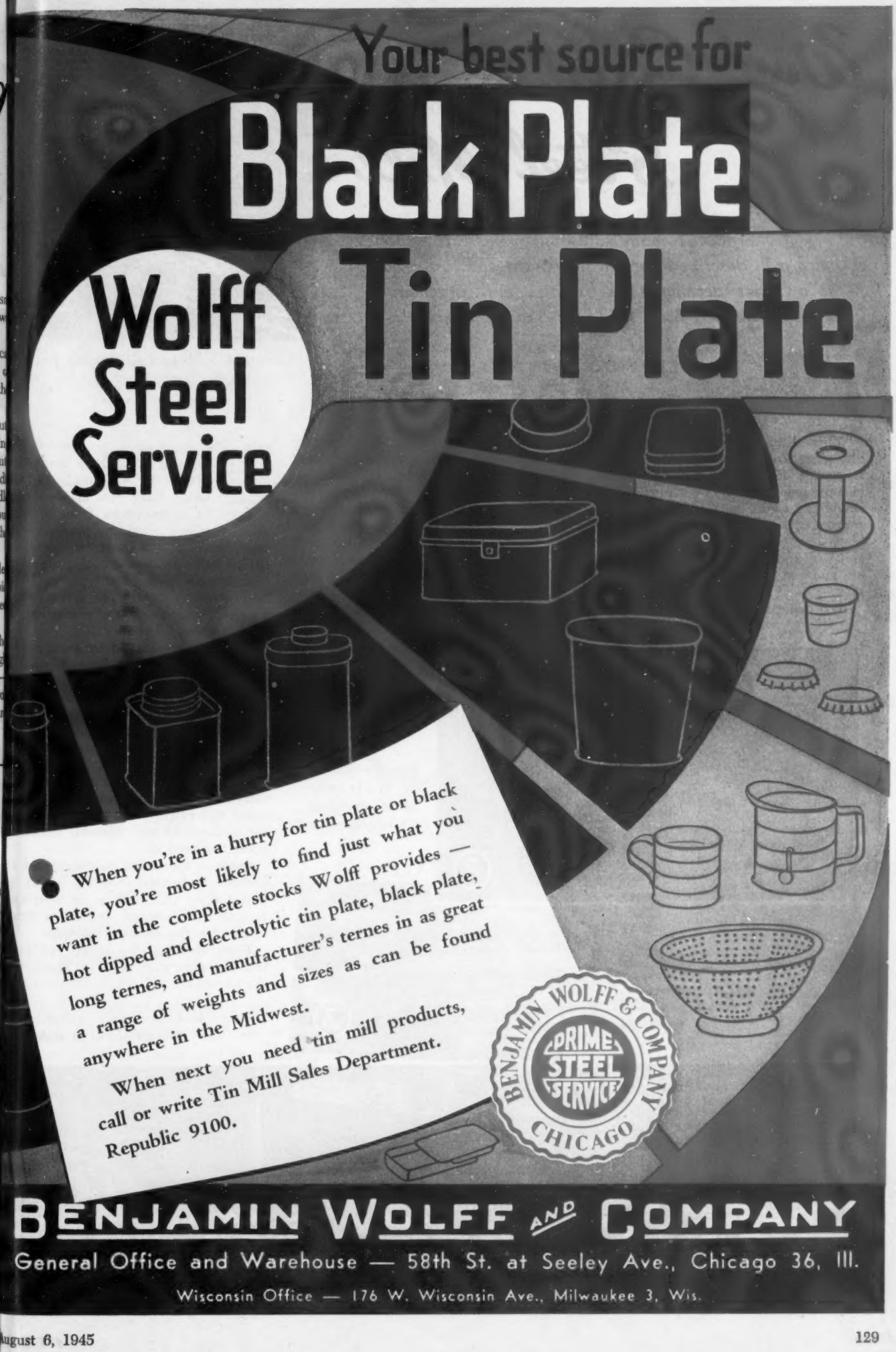
The part is rotated at feed rate through an arc, and the vertical feed spindle housing also is moved in and out through cam action. All three actions of the feed mechanism—feeding the cutter up and down, moving in and out and rotating the part—are mechanically synchronized. The fixture is located on a 9-station Geneva index table.

Welded Transmission Case

WELDED construction afforded economies in time and materials on a job recently undertaken by Steel Fabricators Inc. Cleveland. An intricately designed transmission case for coal mining machinery was made much more compact and strong by welding. This permitted the machinery to be operated in smaller areas and to perform its work in mine fissures formerly inaccessible. The new transmission case measures approximately 53 x 43 in. and is 15 in. high. It is said to weight about 1000 lb less than the previous case. Because this structure is subjected to abnormally heavy shock and impacts, the weldment is constructed of heavy plate sections with thicknesses of 1¼ to 2½-in. predominating.

Individual members were cut to specifications, positioned and tacked into place, and then finish welded on both sides. Main joints were of the full open corner type, shaped to provide good stress distribution and permit application of the finished structure to impact loads of all types. Accompanying illustration shows a typical welded joint of this type, with 3 passes of ¼-in. mild steel electrode being pointed out. Inside welds of both fillet and butt type were made with $\frac{3}{16}$-in. rod. Excess weld metal is easily ground off to specifications with a power grinding wheel.

Photo and data, courtesy Lincoln Electric Co., Cleveland.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West Coast Steel Mill

. . . . produces many different items in modern wire mill, described here in the fourth and last article in a series detailing the facilities and practice of Columbia Steel Co. near San Francisco

By G. ELDRIDGE STEDMAN

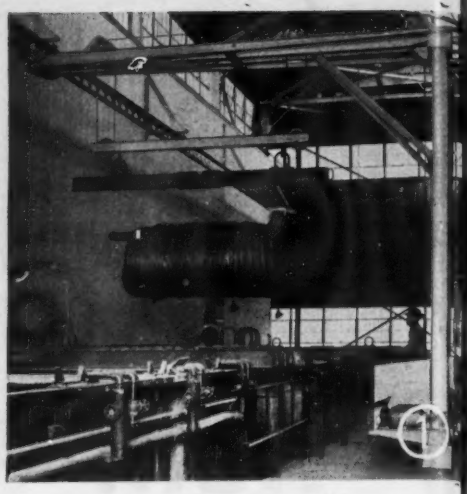


Fig. 1—Wire mill cleaning house. Single leg gantry handles the large coils

WIRE PRODUCTS produced at the Pittsburg Works of the Columbia Steel Co., some 45 miles from San Francisco, include manufacturers' wire, wire rope, strand and cable, nails, tacks and staples, springs and spring wire, woven wire fence and barbed wire. The wire, nail and wire rope mills are thoroughly modern and laid out for straight line production.

Raw material comes into the wire mill, a 1170-ft long building, from storage where the coiled rod is stored by grades and sizes after hot rolling. Cleaning and coating operations are arranged in a straight line. Coils are received on a unique system of air ejectors which push the coiled rods on to a pin hook. A single leg gantry crane thereafter picks up these pin hooks, carrying seven coils or about 4300 lb of rod, and transports them along the straight line of cleaning vats. The sequence is as follows:

Rods come first to three acid bath (dilute 8 per cent sulphuric), the tan capacity being three pins of seven coi each. The cycle varies from 5 to 3 min depending upon the product. Th pins then are lifted out by crane an passed to an automatic cold rinse of th high-pressure immersion type, controlle by photoelectric cell. The action utiliz a spray, down-and-up immersion re quiring about 20 sec.

Pins then are moved by crane to on of three line tanks for light, medium o heavy coating in a 2 to 12 per cent lim solution, depending upon finish produc requirements. This neutralizes the re maining acid, prevents oxidation, pro vides a carrier for the lubricant durin drawing, and establishes the basis fo bright or lime finish. Finally, the pin carrying the coils are craned to the flas baker to receive a 350 to 650° F dryin for a 3 to 20-min interval, dependin upon the product.

Some of the coiled rods receive a su (ferrous hydroxide) coating before th liming dip. This is done by mist spra to give color control and to provide carrier for the drawing lubricant.

From cleaning, the coiled rod move into temporary storage or some of

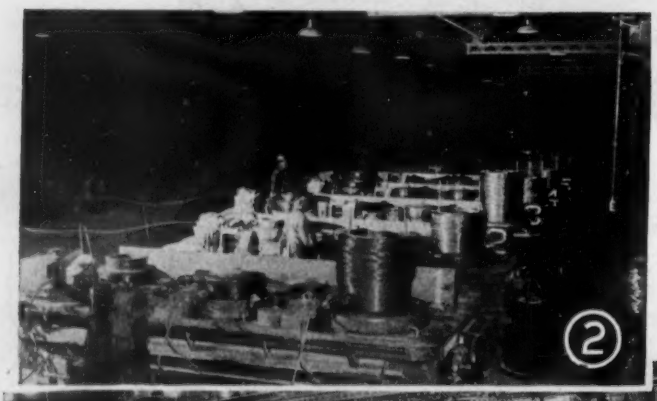


Fig. 2 — Continuous wire drawing is done here

Fig. 3 — Group of multiple cable stranding machines

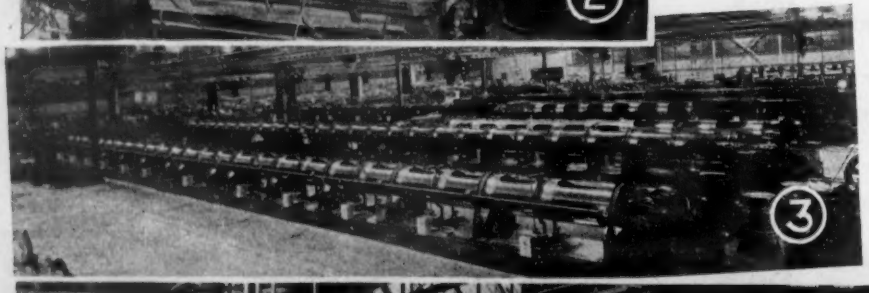
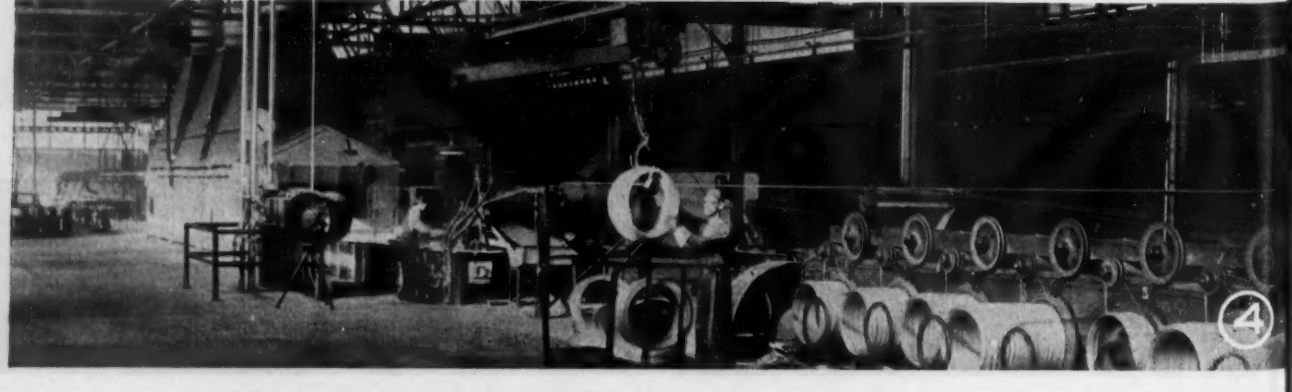


Fig. 4—Coarse wire galvanizing line. Takeup blocks at right



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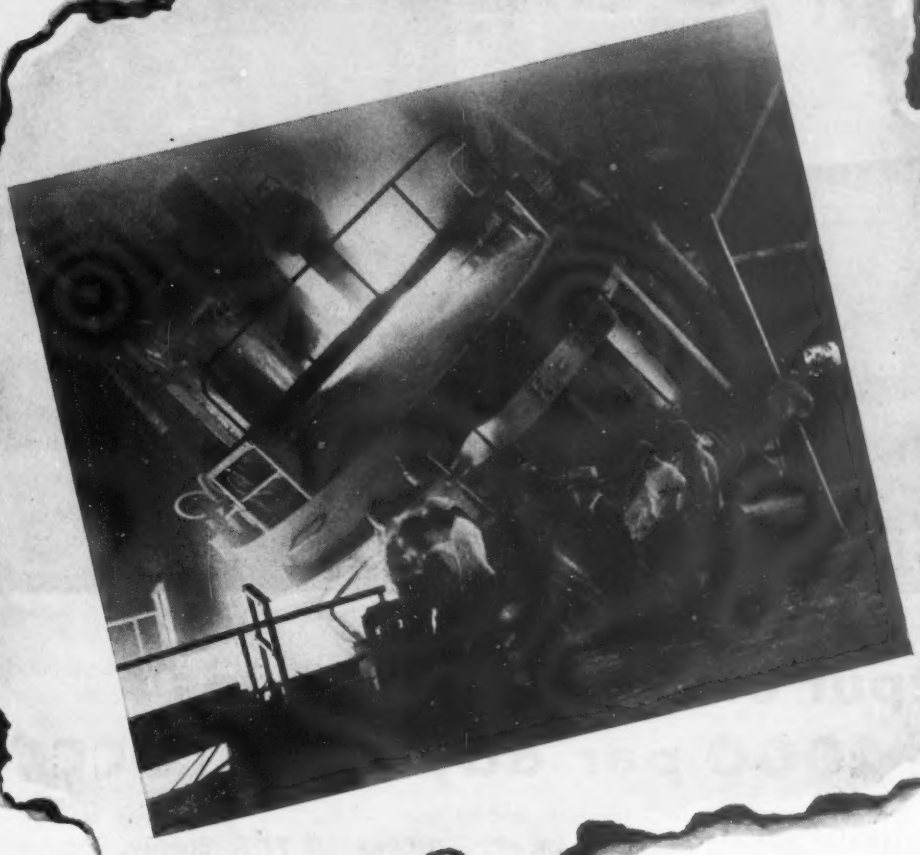

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And there are other savings. The patented counterbalanced electrode arm winch control system eliminates electrode stresses to a minimum, thereby enormously reducing electrode consumption through avoidance of nipple and electrode breakage. Accurate plant records have established this fact; also, that current and refractory costs are sharply reduced.

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THE OHIO CRANKSHAFT COMPANY · Cleveland 1, Ohio

TOCCO

INDUCTION

HARDENING, BRAZING

ANNEALING, HEATING

lows to the shipping dock in mid-building. From this storage, the coiled rod comes to its first drawing in the straight line setup.

Housed in the drawing department are 34 continuous wire drawing machines; thirty-two 24-in. diameter double deck, bench type, motor-driven blocks; twelve 16-in. blocks, and two continuous 12-draft wet wire drawing machines; eight 8-in. bench-type blocks; and one bull block. This rather complete setup gives good production variety on sizes. All dies are tungsten carbide. All machines drawing high-carbon wire have blocks and dies which are water and air cooled. The mill prepares all its dies. All blocks have safety rings with automatic stops. All benches are equipped with safety bump levers that actuate at any body touch.

From these wire drawing machines, the coiled wire moves to three outlets: (1) To process wire for galvanizing, (2) to nail fabrication and (3) to process wire for annealing. These are in addition to the wire that is inspected, tested and shipped direct to market.

The galvanizing arrangement can produce either hard or soft galvanized wire facilitated by three frames: (1) Coarse, 28-block frame, 16 and 22-in. diameter blocks; (2) medium, 24-block frame with 16 or 22-in. diameter blocks; (3) fine, 12-block frame, 8 or 16-in. diameter blocks.

The galvanizing setup consists of lead pans for annealing; the pickle house in which the work is cleaned, rinsed and fluxed; the zinc bath and the variable-speed revolving blocks on which the work is taken up after galvanizing. Soft wire annealing is at 1250 to 1300°. Within the galvanizing furnace, the zinc temperatures are from 810 to 880° F. Variable-speed motors control the time of immersion in the zinc baths, weight of coating depending upon speed, time and length of immersion, and temperature of bath. Either bright or dull finish is produced and galvanized coatings are specified up to 1.2 oz per square foot of surface. Galvanized products are furnished in either high or low carbon.

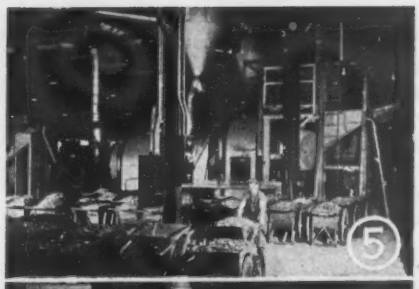


Fig. 5—Continuous cleaning machine handles 4500 kegs of nails per day

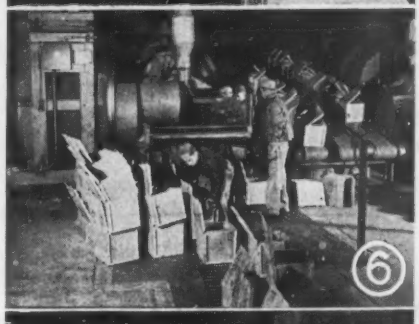


Fig. 6—Shaker tables and exit of nail cleaning line

Fig. 7—Machines for manufacturing nail kegs

The patenting furnace is 60-ft gas-fired open-flame type with a 20-ft lead pan, 24-block takeup. It heat treats high-carbon wire and rods. Wire leaving the furnace is approximately 1900° F and the lead pan is maintained at 900 to 1000° F. The takeup blocks are arranged horizontally. The process is particularly useful in high-carbon spring steel. The blocks are serviced by variable-speed motors having full-length bevel gears. All work from these patenting takeup blocks goes back through the cleaning cycle before drawing.

The annealing equipment of the wire mill consists of four pot type and two radiant-tube gas-fired furnaces with six bases, these having DX controlled atmosphere facilities for bright annealing. Bases are round in shape, the coils of wire being on spiders. The annealing is performed in a 6-hr cycle, being at 1350° F wire temperature; soak for 20 min with a slow cool under inner hood. Bright blue or black anneal is here produced, the annealing being either final or for further process drawing.

Finished wire from this department may go directly to market. It is delivered to the wire finishing department for weighing, bundling and inspection for shipment. All loading in the wire mill is under roof, the building being serviced throughout its middle by a single track capable of holding 14 railroad cars, loading from both track sides.

The testing equipment consists of a 10,000-lb Riehle mechanical testing unit, a 10,000-lb Olson hydraulic tensile machine, and other smaller machines. Every bundle is gaged and inspected as to finish, tensile strength, toughness (jig, crimping or torsion), elongation, and

(*Please turn to Page* 159)

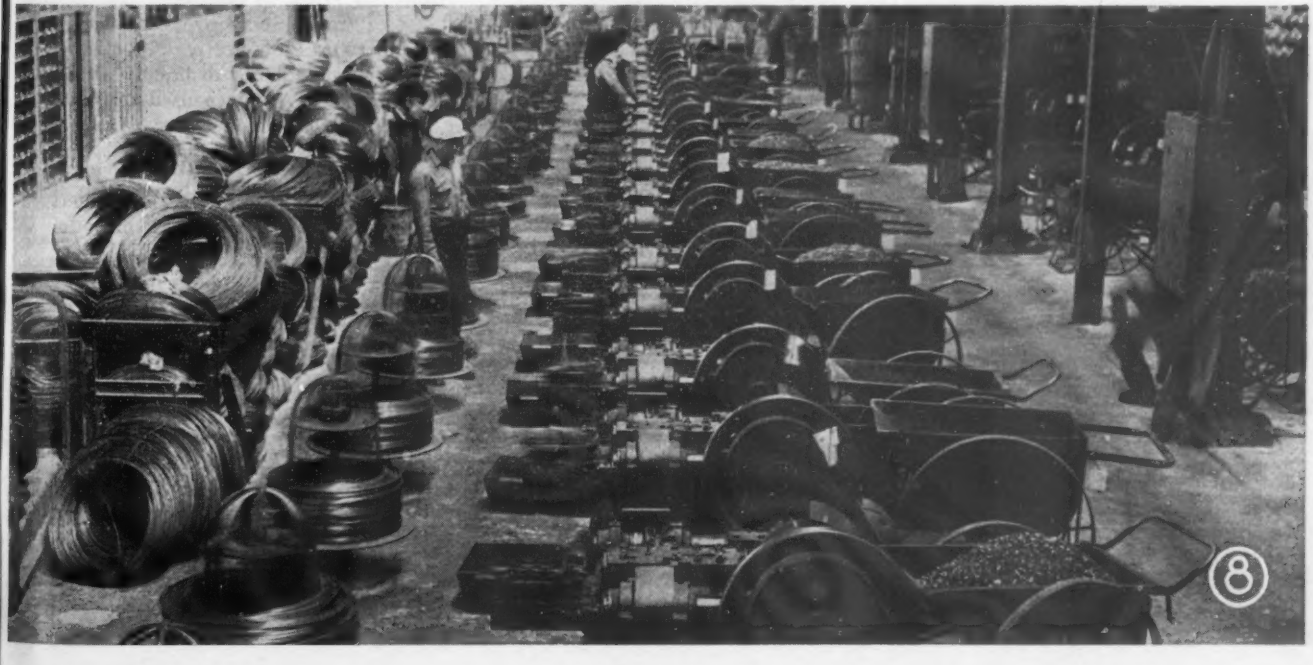


Fig. 8—Machines which produce 390 nails a minute

Automatic Control Aids Aircraft Motor Operation

An automatic control for aircraft power plants combines three engine control operations into one, simplifying motor operation. Primary function of unit is to maintain power output previously selected by pilot, regardless of changes in altitude. To accomplish this, control uses many mechanical and electrical devices. When in use with turbosupercharged aircraft engines, it automatically sets the throttle, engine speed control and manifold pressure regulator, duties formerly performed by pilot.

To compensate for decreasing density of the upper atmosphere, the control regulates the turbosupercharger to increase air compression. Once power output setting is established, turbo adjustments require no further attention until a change in power plant output is desired. A single lever in the cockpit enables pilot to provide correct power plant regulation with one movement of the control.

Unit also reduces the human equation by employing mechanical means to assure constant power maintenance, resulting in smooth, uniform and efficient performance of turbo power plants. At extremely high altitudes or when otherwise necessary, unit limits maximum operating speed of the turbosupercharger to a safe value, preventing damage and insuring uninterrupted, continuous performance.

By reducing amount of control linkage and cables otherwise required from power plant to cockpit, engine control reduces lost motion and is said to provide positive, fast and smooth response from power plant. Pilot may take control away from the automatic unit, made by General Electric Co., Schenectady 5, N. Y., and regulate manifold pressure and engine speed separately, enabling engine to make the most miles per gallon of gasoline.

Portable Oxygen Producer

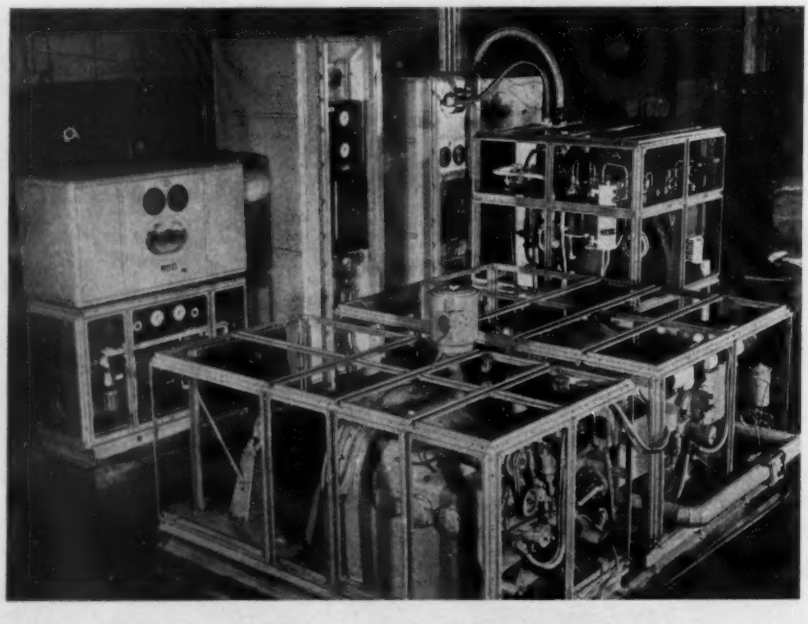
—Eliminates need for return of air forces' oxygen cylinders to base for refilling. Postwar applications anticipated

RETURN of empty cylinders for refilling and, in general, the handling of oxygen cylinders, full or empty, long has been a problem with the air forces. During the North African campaign, oxygen had to be shipped from Johannesburg, South Africa, and in the Pacific, where many bases are located on small and isolated islands, far removed from sources of supply, solution of the problem is even more difficult.

Oxygen is carried in the bombers in flight bottles at a pressure of 400 lb. After each flight, bottles have had to be refilled from cylinders loaded with oxygen at 2200 lb. Cylinders weigh 150 lb each, and the number required for a thousand-plane mission presents a tremendous handling problem.

To help solve the difficulty, Clark Bros. Co. Inc., Olean, N. Y., subsidiary of Dresser Industries, Cleveland, has produced a portable oxygen unit which can be flown to advanced bases. As shown here, it can be broken down into individual pieces, each weighing less than 3000 lb, and small enough to be loaded into the cargo hatch of a C-46 transport. With no special supplies other than those ordinarily found at such bases — gasoline, oil, and a little water — the unit can fill oxygen cylinders within 24 hours after it has been landed.

Co-operation between Clark Bros. and M. W. Kellogg Co. resulted in development of a plant meeting Army requirements. Unit is said to produce more oxygen than previous plants almost twice its weight, and a low operating air pressure of 100 lb makes it safer. Men can be trained to run it in a week. Light weight of the dry-oxygen unit was achieved by aviation type techniques of design, using light fittings and piping. Unit is powered with light-weight aviation engine.



Plant must produce, not merely oxygen, but chemically pure oxygen. It must be free from invisible water vapor that would freeze and clog oxygen lines or masks at the low temperatures of high altitudes. A compressor, operating without oil and requiring no lubrication other than that supplied by segmental carbon rings on light aluminum pistons running in highly polished chromium plated cylinders, is used. It is a high speed unit, its pistons traveling 1200 fpm.

The same principle was used in compressor charging the oxygen cylinders. Also, a small expansion engine, designed to operate on 100 lb of air pressure, is said to have over 80 per cent efficiency.

Oxygen is produced in a 6-ft cold box by liquefying ordinary air and allowing liquid to boil, so that oxygen and nitrogen vaporize separately. Temperatures of nearly 300° below zero F are required to liquefy air by this process. A device used for cooling air to low temperature is a heat exchanger designed by Dr. S. C. Collins of Massachusetts Institute of Technology. There are 24 heat exchangers in the cold box, using 11 miles of paper-thin copper ribbon 15/100-in. wide, making it possible to keep the size of exchangers down to 5 ft. If copper ribbon were not used, exchangers would have had to be thirty times as large as they are.

The company also has developed a semi-trailer model, weighing 10 tons and less than 20 ft long, which can be hauled to any front line base a heavy Army truck can reach. A number of postwar applications for both types of dry-oxygen generators are anticipated.

J&L STEEL

COLD DRAWN BARS

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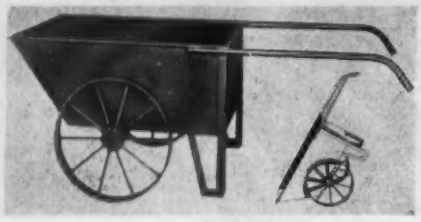
JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA

INDUSTRIAL EQUIPMENT

Carrying Unit

A new Multi-Purpose cart is offered by Palmer-Shile Co., 796 South Harrington, Detroit 17. This unit is suitable for hauling and dumping ashes, scrap, small parts, mixed concrete, liquids, fertilizer and other miscellaneous material. To meet varied uses, it is

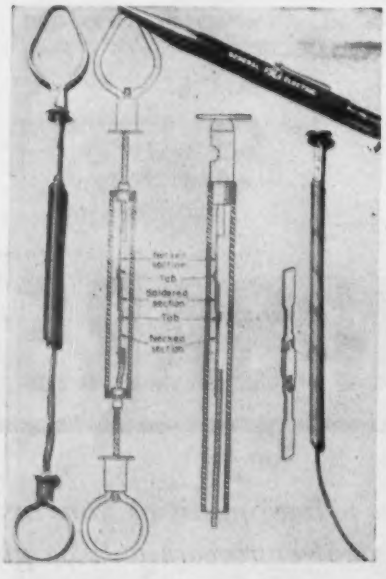


designed and balanced for easy wheeling and convenient dumping.

The cart has a heavy steel body with a reinforcing flange around top edge. tubular handles extend 34 in. from the body. Legs are of heavy angle iron, and construction is all-welded throughout. It is equipped with two 24 x 2 in. steel spoke wheels. Overall measurements are 79 in. long, 30 in. high, 30 in. wide.

Fuse Links

A new line of Hi-surge, double-duty fuse links, with low current N rating of 1, 2 or 3 amp, is announced by General Electric's Transformer Division, Schenectady, N. Y. Available in both universal cable-type and flip-open type designs, they are mechanically and electrically interchangeable with conven-



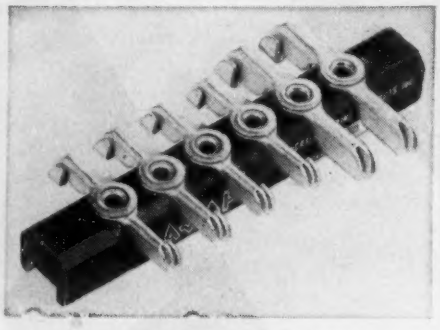
tional fuse links of same type now in use.

Fusible element consists of two identical punchings of a low-melting point alloy. Two punchings, each consisting of a reduced fusible section and a wider portion, are mechanically interlocked and joined with a solder of desired melting temperature. At low 60-cycle short circuit currents, heat generated in reduced sections of fusible element is conducted into wide portion until solder melts, permitting two sections to be pulled apart. At higher 60-cycle, short circuit or surge currents, reduced section melts and severs link before heat conducted into wider section can melt the solder.

Locking construction of two punchings prevent ends of soldered joint from peeling apart under tension, yet permit punchings to separate freely after solder melts. Length of restricted sections is held within limits of plus or minus 0.005-in. in manufacture and a definite amount of solder is applied in joining the punchings, so that the time current characteristics are accurately controlled for both low current and surge blowing.

Connector Strip

A connector strip, specially adapted to hangers for sectional wiring is offered by Airecraft-Marine Products Inc., 1591J North Fourth street, Harrisburg, Pa., for use with the company's solderless knife-



disconnect splicing terminals. It offers quick assembly of any number of terminal connections on a single block of insulating plastic. Integral members are riveted to plastic base. Any knife-switch connect end may be specified to accommodate any wire size from 22 to 10 inclusive and, where required, the opposite end may be made for a different wire size.

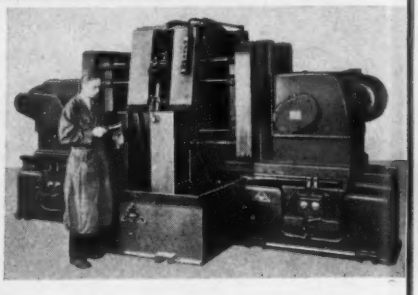
Ample space is given for access to any one connection and wire is connected by holding it vertically in contact with strip member and then pulling back. Permanent or temporary shorting connections can be incorporated between two or more adjacent terminals.

Steam Tank Heater

Brown Fintube Co., Elyria, O., introduces an immersion type steam tank heater for use with any material with viscosity that can be lowered by heating. Unit consists of a number of lengths of fintubes connected in series and inlet and outlet steam lines. The heaters have low center of gravity. Cross handles aid in positioning the heater over the discharge outlet in the car, in blocking heater at various depths and removing unit after car is empty. It is available in two sizes: No. 642 for use with tank cars and No. 442 for use with tank trucks.

Trunnion Type Machine

A 2-way trunnion type machine for drilling, chamfering and reaming yokes for universal joints has been designed by LeMaire Tool & Mfg. Co., Dearborn, Mich. The machine is capable of accommodating sizes ranging from 7/8 to 1½



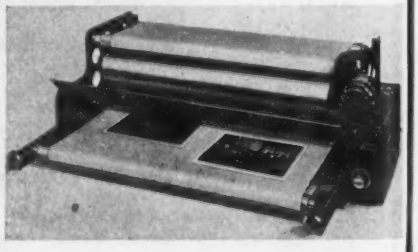
in. diameter. By reaming from two directions each tool does half the work. In addition to achieving line-reaming accuracy, production is speeded up. Reamers are driven by a special quill type spindle built in trunnion with power transmitted from multiple head through a flexible drive.

The machine consists of a manually operated 6-station trunnion mounted on a fabricated base on which are mounted two of the company's standard self-contained slide type hydraulic units. Change gears provide various spindle speeds for the 5-spindle drill heads.

Cycle of operations is as follows: Station 1, load and unload; station 2, spot drill and chamfer; station 3, rough drill; station 4, finish drill for reamer; station 5, semifinish ream and station 6, finish ream.

Photo Print Dryer

Blueprints or black and white prints, matte or semimatte prints, or glossy



prints can be dried on the new B-8 photo dryer offered by Peck & Harvey, 4327 Addison street, Chicago 41. Thermo-

(All claims are those of the manufacturer of the equipment being described)

USE SCULLY-JONES

Style "B"

DRILL CHUCKS

FOR A POSITIVE DRIVE in any machine having a Morse Taper hole in the spindle . . . Collet action, hardened and ground, concentric within .002" and designed to allow close-center multiple drilling. Furnished in Morse Tapers 0 to 5, accommodating drills from #60 to 1⅜" diameter.

Style "B" Drill Chucks are now standard equipment in plants of many leading automobile and airplane manufacturers. Economize by including them in your production tooling setups—for jobs of tomorrow.

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static control is available. Variable speed drive motors and controllers permit instantaneous speed changes over a range of 6 in. to 3½ ft a minute.

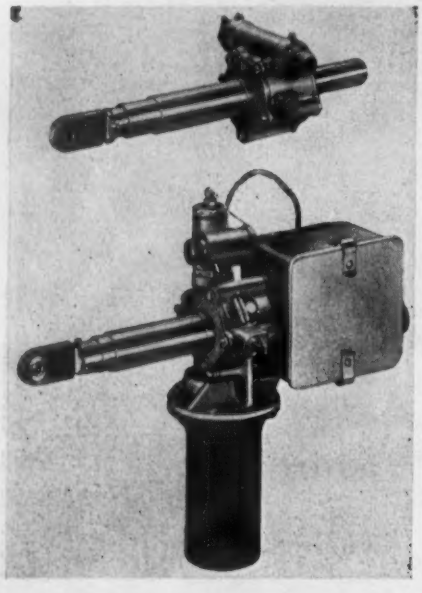
A chromium plated copper drum that finishes photos with high glossy surface is included. Specially woven seamless band, pressed steel framework are featured. Steel clad, refractory insulated Nichrome heaters, nickel contacts, and asbestos insulated nickel wire are used.

The unit is available in 26 and 44 in. widths. The 26 in. dryer, operates on 110 v, ac or dc and is 40 in. long, 28 in. wide, 13 in. high. The 44 in. dryer, operates on 110 v, ac or dc, is 58 in. long, 28 in. wide and 13 in. high.

Dual Linear Actuators

Dual operation is possible with the two new linear actuators offered by Foote Bros. Gear & Machine Corp., 5225 South Western boulevard, Chicago 9. The primary actuator is powered by 1/6-hp electric motor. The secondary actuator (motorless type) gains its power from primary by a flexible shaft coupling which synchronizes the two units.

Both actuators have a linear action of 55 in. at an extension speed of 2 sec and a retraction speed of 9 sec. Travel of screwjack is accurately controlled by limit switches and stops may be adjusted by a single screw. These two models are



capable of handling work loads up to 750 lb with a static load capacity of 2500 lb.

The 1/6-hp motor of the primary unit operates at 800 rpm from 26 v, dc at 11½ amp and is equipped with a magnetic brake for instantaneous stops and to prevent gear train from creeping due to vibration of plane. The company's Aircraft Quality gears are used in these actuators. Primary reduction spur gears, steel worm and screwjack are hardened for accuracy. Steel parts are Magnafluxed and cast aluminum housings are X-ray inspected.

Dimensions of the motorized actuator are 13 in. long, 11 in. high and 4⅛ in. wide, weight, 7 lb 1 oz. The shaft driven model is 10 11/16 in. long, 3½-in. high, 3¾ in. wide and weighs 2 lb 12 oz. The latter may be used separately by driving off of an engine or any remote source of power.

Single Unit Shakeouts

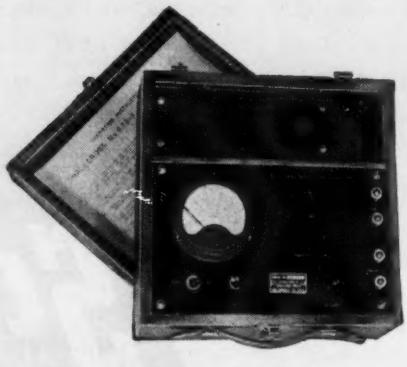
Two new single unit shakeouts, known as Foundromatic, are announced by Allis-Chalmers Mfg. Co., Milwaukee. The 8 x 10 ft, 25 ton load unit is designed to handle 90 per cent of tonnage cast in average jobbing foundry, where castings range from 500 to 50,000 lb each. The

smaller unit, 6 x 8 ft, is rated at 15 tons capacity.

The units increase capacity by use of two bearing construction. Outer bearings are eliminated, impact loads are absorbed by resilient support springs at each end of shakeout. Vibratory action is produced by the combined effect of a heavy duty eccentric shaft (offset and enlarged between the bearings) and two true running balance wheels which counterbalance the weight of the shakeout, result is a uniform circular motion throughout shakeout deck surface.

Test Set

Milliohmmeter No. 673-F, introduced by Shallcross Mfg. Co., Collingdale, Pa., has linear scales which eliminate crowd-



ing of the higher values of resistance at one end of the scale. The six scales have ranges as follows: 0-0.5-1-5-10-50 and 100 ohms full scale. This range of resistance measurements bridges the gap between regular milliohmmeters that are used for low resistance testing and ordinary ohmmeters used for relatively high resistance measurements.

Instrument utilizes separate connections for current and potential so as to minimize effect of lead and contact resistance when measuring low values. It uses a single No. 6 dry cell battery carried in a battery compartment built into the instrument.

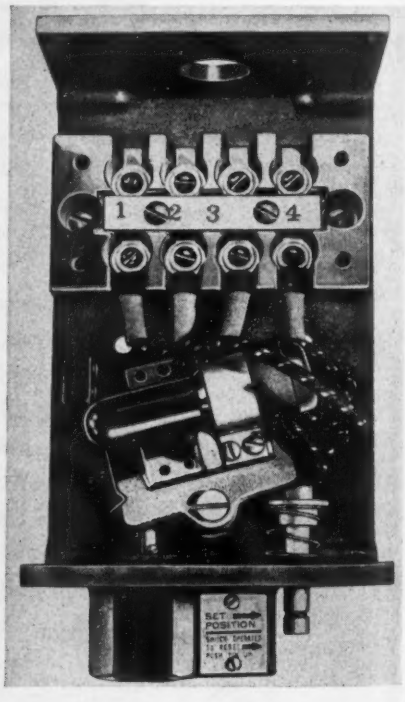
Inspection Lens

Ess Instrument Co., Ft. Lee, N. J., announces a new lens for its Cat's Eyes inspection units for checking boiler and furnace interiors and their contents while in operation. This lens, type O, provides a wider field of vision with less reduction than is available through standard type G lens; both are interchangeable.

Cat's Eyes equipped with this type lens will show at a glance from distant points, the flame with its characteristics of color, turbulence and haze and objects inside a boiler or furnace such as as tubes and articles being heat treated.

Pressure Switch

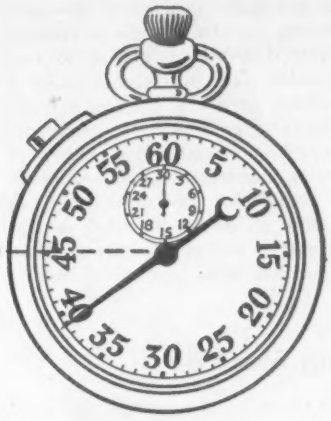
Designed for use with built-in carbon dioxide fire extinguishing systems, a new pressure switch is offered by Walter Kidde Co., New York. It assists in iso-



lating fire by automatically cutting off electrical circuits in fans, blowers or other electrical equipment when the extinguishing system operates. It is a self-contained, mercury contact type switch suitable for applications which use gas or air pressure.

The switch is connected by a bleed

WHEN *YOUR TIME* IS A FACTOR



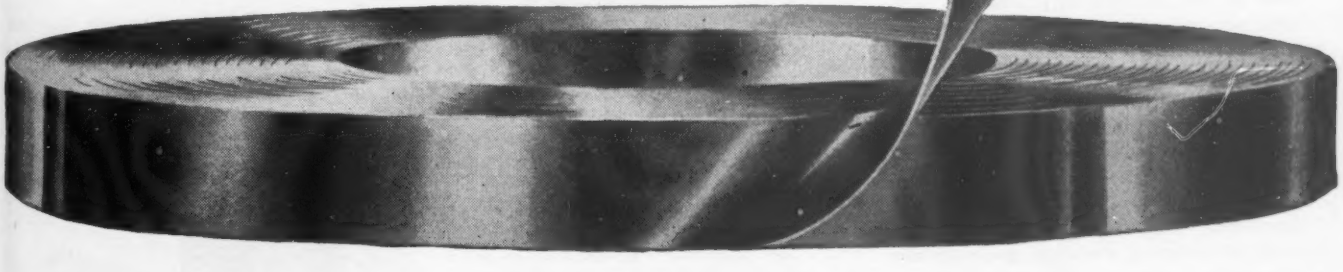
Follansbee

COLD ROLLED STRIP

Follansbee's compact organization possesses a flexibility which frequently permits the revision of mill schedules to meet customer emergencies.

In selecting your supplier of Cold Rolled Strip, it's advisable to consider this important Follansbee operating feature . . . to prepare now for future needs in the event your present requirements are not pressing.

For information on Follansbee's ability to serve you, you are invited to consult the General Offices or the nearest Follansbee Sales Office or Agency.



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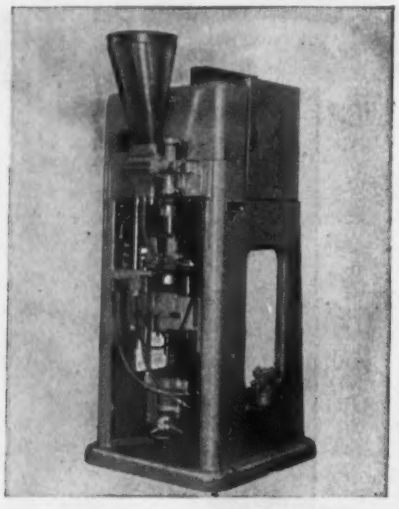
pipe from the main distribution line and is operated by carbon dioxide in passing through this distributing piping to discharge nozzles. Gas pressure actuates a plunger which trips the breaker arm of switch, opening or closing circuits desired. Device is available for control of two, three or four circuits, each of which may be wired for normally open or closed operation. It is provided with a manual reset to restore circuits to their original position after operation due to fire.

Molding Machine

No. 200 D model of a completely automatic molding machine is offered by F. J. Stokes Machine Co., Philadelphia 20. Improvements include a new type trap or checking device, sensitive to the fraction of a gram, which weighs the finished moldings and operates a safety cutoff to stop machine in case all molded pieces do not eject into and pass through trap. If a



piece sticks in the mold or the molding is of insufficient weight, machine will stop and signal for attention. Thus possible damage to mold or machine from double filling or other failure in operation is practically eliminated.

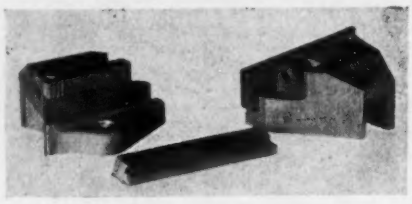
Other features include an improved combination push off that ejects mechanically in case multiple air jets do not blow molding into trap; also an improved triple-feed device that is adjusted to distribute exact quantities of molding powder where desired in mold.

Capacity of this machine is 15 tons; it molds parts with a projected area up to 14 sq. in. and diameters up to 4 in. Machine is self-contained, fully automatic, thoroughly safeguarded, requires a minimum of operating attention, is electrically heated and powered and requires 5 hp.

Chaser and Holder

Landis Machine Co., Waynesboro, Pa., has developed a new chaser and chaser holder combination which simplifies interchanging of chasers and also imparts greater rigidity and strength to combination to insure finer thread accuracy.

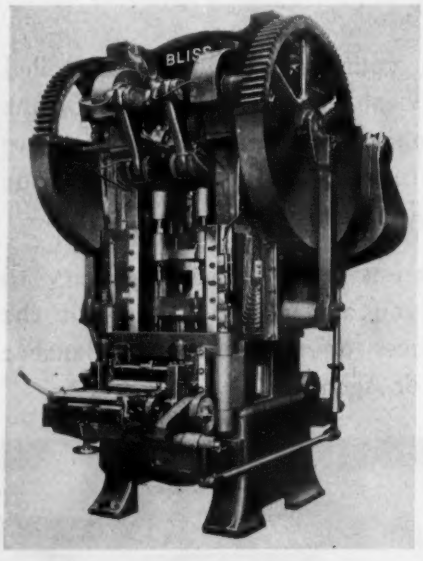
The Lanrac chaser and holder employs a rack tooth arrangement to locate the chaser in its approximate position. Chaser has rack teeth milled for its full length on off-set seating surface and rack teeth are milled on chaser clamp at end nearest



the chaser cutting edge. When interchanging chasers, chaser is placed on holder in its approximate position and clamped lightly. An adjusting screw which engages the back end of chaser clamp is then used to advance chaser and clamp as a unit to exact position. Elongated slots in chaser clamp permit sufficient lateral movement of clamp slightly greater than pitch of rack.

Automatic Toggle Press

No. 3½-B toggle drawing press, introduced by E. W. Bliss Co., 53rd street and Second avenue, Brooklyn 32, N. Y., has automatic operation to handle coil brass or steel. The blankholder serves the dual purpose of blanking disks from coil strip and holding blank for drawing operation. Coil stock is fed through a

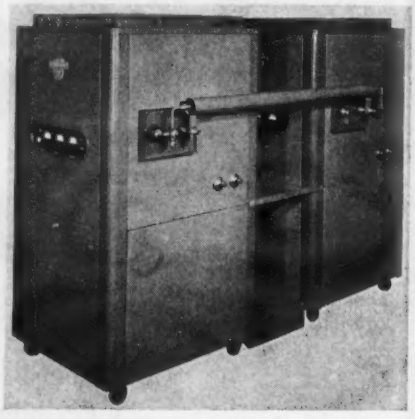


seven roll straightener to remove curvature, a precision double roll feed and a shear type scrap cutter. An automatic stock oiler is attached to the feed as stock lubrication is desirable on drawing operations. Scrap cutter is provided with spring holddown and four edged tool steel blades. Incoming feed rolls and straightening unit are mounted on a vertical pivot so that they can be swung out of the way for insertion of dies. The feed and scrap cutter are driven by elliptical gears.

Press illustrated is a No. 3½-B straight side, single crank toggle drawing press. It is built with a four piece steel tie rod frame construction. Twin driving gears are employed on the crankshaft. A twin drive is furnished on the blankholder. Double gearing is provided. It is also equipped with a pneumatic friction clutch with electric pushbutton control. An air brake is furnished for stopping the flywheel. Flywheel and driveshaft are mounted on Timken roller bearings. Main bearings are bronze bushed.

Coaxial Equalizer

By use of the new coaxial equalizer, Induction Heating Corp., 389 Lafayette street, New York 3, has coupled two of their standard model 1070 thermonic induction generators so that full output of

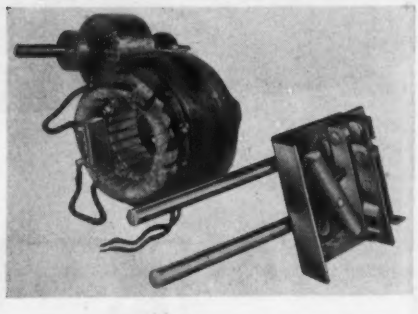


both can be obtained from a single set of terminals. As each generator has an output of 1070 btu per minute, full 40 kw of power is available for use in any desired application with a single control station operating the tandem generator setup.

Installation of the coaxial interconnection is made between power section of generators to give electrical stability. Equipment can be operated single phase, two phase or three phase, making it possible to install equipment from any power supply with full load power factor at approximately 90 per cent.

Motor Starting Switch

The new split phase motor starting switch offered by Motor Controls Inc., 469 East Ohio street, Chicago 11, does not use centrifugal action or draw upon



any outside form of electromagnetic action. It is activated by magnetic field of the motor. It draws power from stator through two iron poles inserted into sta-

"Pipelines that flex" for OIL...STEAM...GAS

A few of the many American Flexible Metal Hose and Tubing assemblies engineered complete with fittings or couplings for specific applications.

VIBRATION or continual movement in a connection is bound to cause trouble sooner or later . . . unless the connection is *engineered* for the job.

Illustrated are a few American Flexible Metal Hose and Seamless Tubing assemblies, each of which *is* designed to meet a specific set of conditions.

Such a connection can be developed for you . . . with the necessary resistance to pressure, temperature, chemical or abrasive action and mechanical stress.

For detailed information on the range of types and sizes of "American" products, write for Publication SS-50. Manufacturers, engineers and machine designers alike will find it a thoroughly practical guide.

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THEY SPECIFY "THE GEAR WITH A BACKBONE"

TO PROTECT TOOL POINT ACCURACY

In Cincinnati-Bickford Super Service Radials, Farrel-Sykes continuous tooth herringbone gears—the famous *Gear with a Backbone*—are used to transmit a smooth constant flow of power to the drill spindle.

Backbone, the place where the helices meet in sharp "V's" to form continuous teeth, provides greater strength and load-carrying capacity in minimum space. Gradual tooth engagement, with several teeth in various stages of mesh simultaneously, makes the power transfer smooth and continuous—eliminating vibration which could otherwise interfere with accuracy at the tool point.

Precision generation by the Farrel-Sykes method . . . accuracy of tooth contour and tooth spacing within close tolerances . . . uniform distribution of the load on each tooth and across the entire face . . . the balancing of axial thrusts by the opposed helices . . . are additional factors which assure correct tooth action and contribute to efficient operation and maintenance economy throughout a long life.

Wherever power transmission must be smooth and vibrationless under all conditions of load and speed, specify the *Gear with a Backbone.*

For information about Farrel-Sykes gears and gear units send for a copy of Catalog No. 438.

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Farrel-Birmingham

tor. A flyer is mounted on a shaft so that when the poles are energized, the flyer will swing into position. This swinging action makes electrical contact which engages starting winding, free of any ac vibration or arc. Cutout of the starting winding can be made to operate at usual 1450-1500 rpm or at any desired critical point of speed. A spring forces flyer away from pole pieces instantaneously when magnetic force drops.

When current is applied to a split-phase motor (from dead stop or from overload while running), there is an extremely high amperage which causes an increased magnetic force in the motor's field which activates the switch. Current, according to the momentary speed and load, controls the switch-action.

Plug Gage Collets

Colored plastic collets, green for the go plug and red for the no-go plug in cylindrical plug gages are introduced by United Precision Products Co., 3524 West Belmont avenue, Chicago 18. Both plugs are contained in the same

handle of Dublife reversible plug gages. Plastic grips plug with a secure hold and it can not be twisted out by vise or wrench. There is no slipping of plug. It is removed by use of a drift. Plastic eliminates scratching and marring of plug. Weight is reduced by these collets.

Collets are dielectric, thereby adding to the protection of gage against electrical effects. The handle is designed so that either plug can be removed without disturbing the other.

Drill Grinder

An improved model drill grinding attachment is announced by A. D. McBurney, 939 West Sixth street, Los Angeles 14. This fixture has a verticle post and provision for accurately grinding round shank drills in four point

Here's the BOOK ON PALLETS . .

24 PAGES pictorially presented, showing CLARK Fork Trucks and pallet methods in 32 different types of materials handling operations.

Contains illustrations and specifications of different pallet designs.

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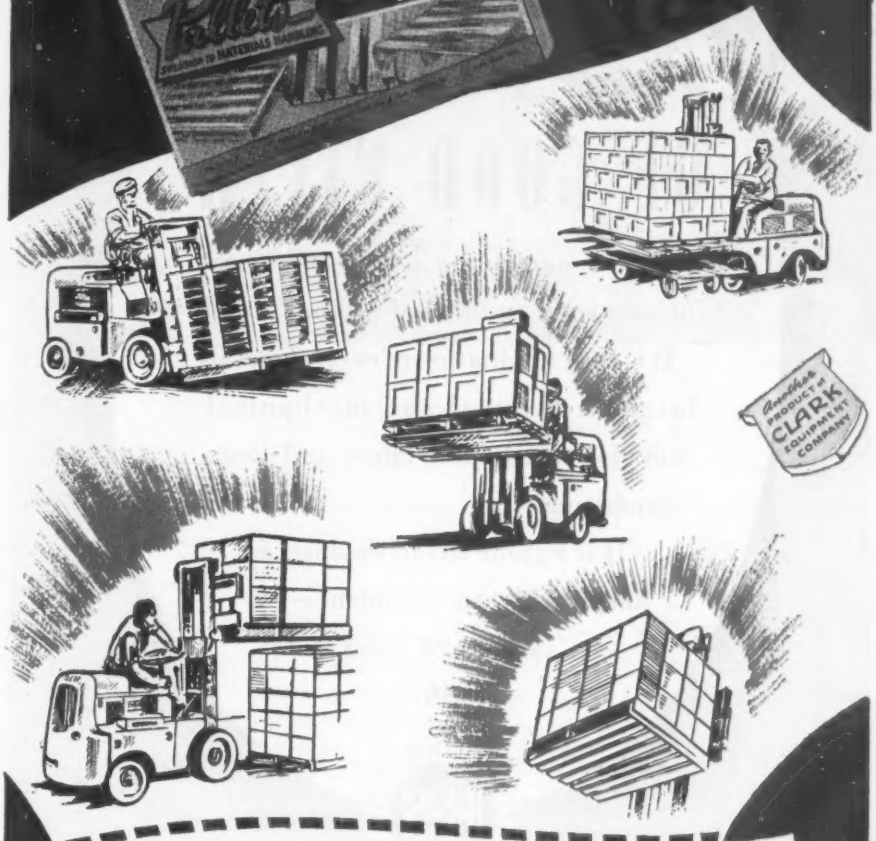

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angles: 49, 59, 69 and 88°. It will hold drills from 3/22 to 1 1/16 in. in diameter and will sharpen short, medium and long twist drills from 1½ in. up to and including 11 in. in length. Recessed angle guides eliminate the need for a protractor in setting for proper point tapers. Four angle feature gives properly ground points for clean fast work in steel, wood or plastics.

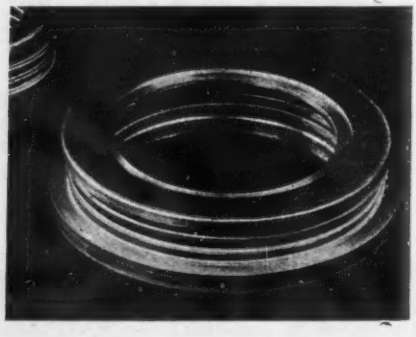
Steel Stamp

A new steel stamp, developed by Acme Marking Equipment Co., 2222 West Fort street, Detroit 16, stamps clear impression without chipped or

mushroomed striking head which is eliminated by a process of heat treatment and tempering. After heat treatment stamps are double drawn in temperature controlled salt baths. Made for marking letters and numbers, they are sold under the tradename of Rams Head.

Rotating Seal

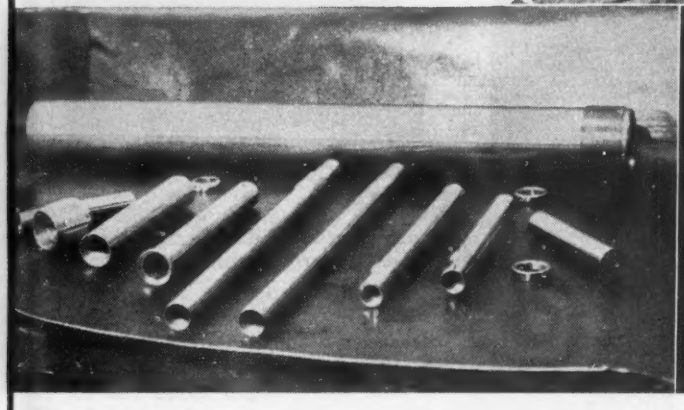
Designated as spring-life Gyro-Seal, a new type rotating seal has been developed by Cook Electric Co., 2700



Southport avenue, Chicago 14. No auxiliary springs are required in the application of this seal as the inherent spring

BEAN SHOOTER

De Luxe Model



ABOVE—Trench mortar in action against the Japs. The Infantry's mortar crews have been of inestimable value in the Pacific area in pinning down the enemy and in breaking up his counter attacks. Signal Corps Photo.

LEFT—Ostuco Seamless Steel Tubing parts used in the manufacture of the Army's new-type 60 mm. mortar, built by Kennedy-Van Saun Mfg. and Engineering Corporation, Danville, Pa. and Read Machinery Co., York, Pa. Kennedy-Van Saun photo.

In principle, the Army's new 60 mm. Mortar M5 is a very simple weapon. Just drop a mortar shell down a piece of tubing and it bounces out again . . . like a package of forked lightning. Thanks to an ingenious sighting device and the skill of the 2-man crews who work these "muzzle-loaders," mortar fire is deadly accurate and devastating—as many a dead Jap even now must be testifying before his ancestors.

It is noteworthy that seamless steel tubing plays the major role in the construction of this weapon. It supplies, besides the barrel, an even dozen parts of the assembly. Obviously, Quality with a capital Q must go into that tubing. That's where Ostuco's quality tradition, extra-thorough testing methods and experienced skill in tube-making are contributing their share to mortar production . . . and many another war job. Ostuco's *delivery* record too has helped keep many a contract schedule *on time*. These are important facts to consider in your postwar planning. Call the office nearest you today for a discussion of your possible requirements in seamless steel tubing.

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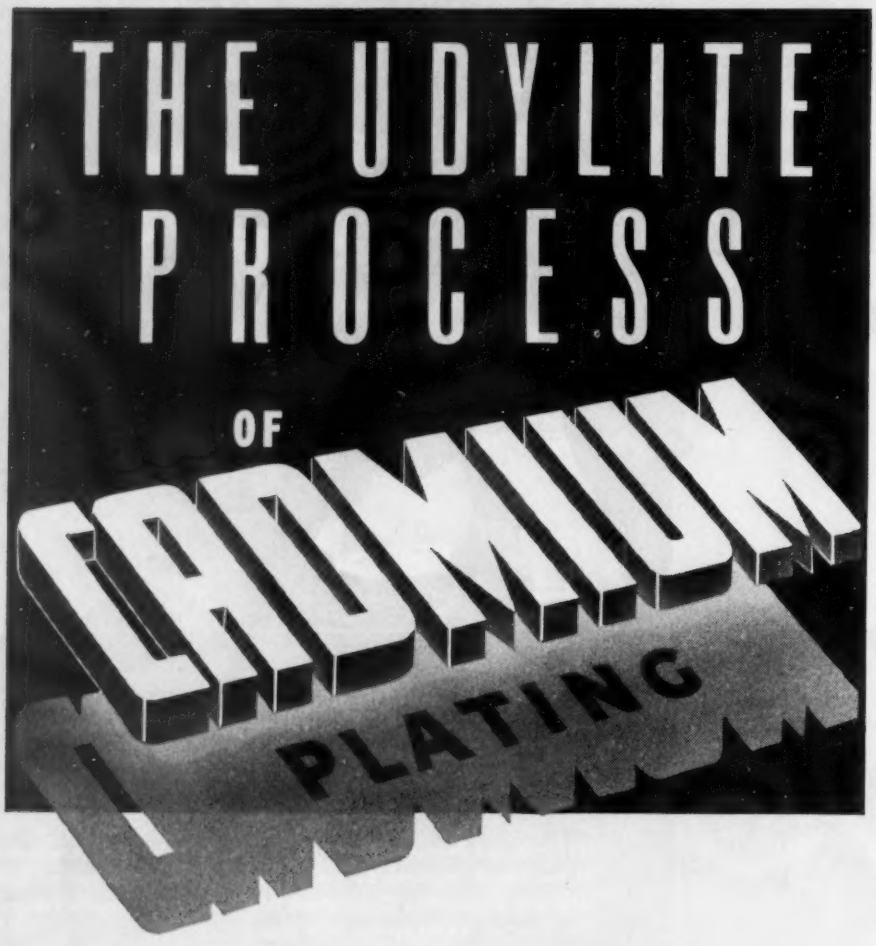

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Udylite-Cadmium is more than a metallic coating. . . . It is a successful combination of a metal, a time tested process, specially engineered equipment, and chemical skill, backed by competent engineers and electrochemists whose knowledge was gained first hand in the field.

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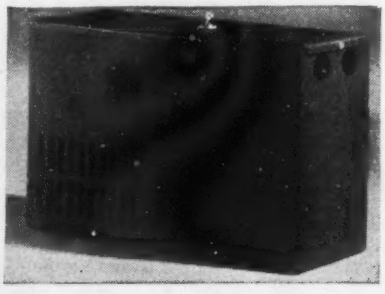
rate of the bellows is sufficient in most cases to maintain the required pressure on sealing surfaces. Bellows can be made of all types of metals to suit the condition of each application. Seals will operate on both external and internal pressure and have been built to withstand 5000 psi in a range from less than 1 rpm to more than 4000 rpm. Lapped finishes of the sealing members can be provided to meet specifications wherein one light wave of flatness is required.

Electronic Rectifiers

The magnetic chuck rectifier is a new development in industrial electronic control to convert 110 v ac to 110 v dc. They embody full wave rectification by electronic tubes mounted on shockproof



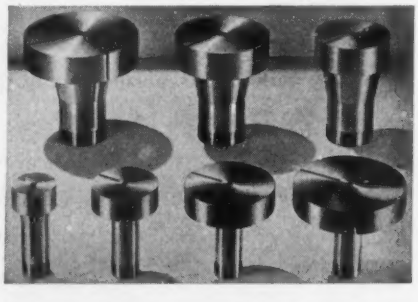
bases, precision built transformers, condensers and replaceable protection fuse.

EPCO No. 2 delivers 2 amp (approximately 250 w) at 110 v dc and EPCO No. 6 delivers 6 amp (approximately 700 w) at 110 v dc. Two of the No. 6 units can be used where requirements call for 12 amp output; three can be used for 18 amp output, etc.

These devices are available from Davis & Murphy, 5252 Broadway, Chicago 40.

Step Collets

Over capacity step collets are available from Zagar Tool Inc., 23880 Lakeland boulevard, Cleveland 17, for both 1 and 2 in. collet fixtures. The 2 in. collets,



No. 201, are made in 3, 4 and 5 in. head sizes; the 1 in. collets in 2, 3, 4 and 5 in. head sizes. The 2 in. collets can be used wherever a type 5-C collet is used. Heads are 1 in. thick and made of M-tempered tool steel, finish ground complete and are left in a soft condition so they can be bored to individual job.

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Infra-Red Heating

(*Continued from Page* 119)

fers the use of tungsten lamps to carbon filament lamps, because their higher operating temperature affords a more rapid heat transfer. Then, too, he explains that when the carbon filament sublimes (vaporizes), the carbon condenses on inside of the lamp globe and there absorbs some of the radiated energy, in turn raising lamp temperature, speeding further sublimation and reducing lamp life. At the same time, output of radiated energy is continually declining as more and more is absorbed by the carbon deposited on the inside of the lamp, cutting the energy available to heat the work.

Tungsten, on the other hand, sublimes at a much higher temperature. Too, the tungsten lamp is filled with an inert gas usually under a pressure of one atmosphere which further decelerates aging tendencies. Fig. 6 diagrammatically illustrates the result in terms of lamp life and efficiency (ratio of energy output to input).

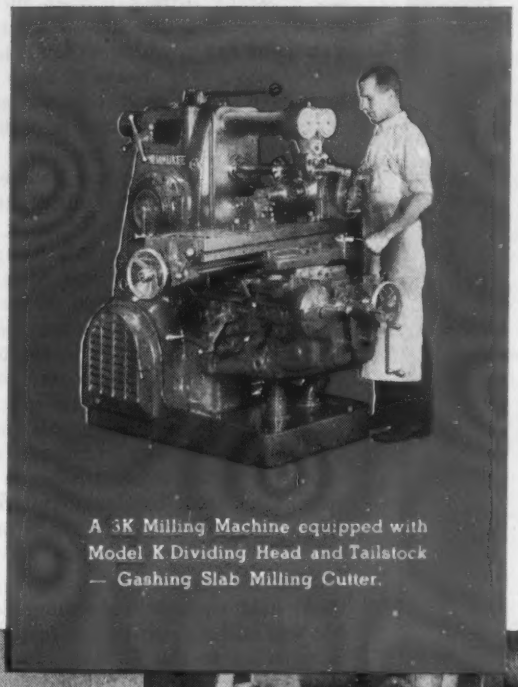
Reflector Surfaces: Radiant energy is reflected in the same manner as light but it requires a different type of reflective surface to obtain maximum results. The greatest efficiency of an infra-red lamp is achieved by the use of a reflector which redirects the stray energy emanating from the heating lamp. Tests show that virgin gold reflects 96 per cent of the infra-red energy, while polished copper, polished silver and processed aluminum (91 per cent) follow in that order. Thus, first infra-red reflectors were gold plated for most effective results.

However, after a few months use, the gold had a tendency to disappear and the surface to become dull. Special cleaners were developed as it was thought abrasive action was removing the gold plate. Even cleaning by dipping was developed to avoid any abrasive action. Yet the gold kept right on disappearing. Then a gold plated unit was designed with the lamp sealed in, similar to the present day sealed-beam headlamp. But the gold continued to disappear.

Chemical analysis disclosed that the gold remained in the metal surface but that it had been absorbed in the brass of the reflector. It is a well-known fact that base metals do absorb noble metals. In fact, if clean gold and silver blocks are held together under pressure, the dividing line will gradually disappear as they tend to alloy into each other. This effect was occurring in the gold plated reflectors—the gold was dissolving into the brass.

Polished copper and polished silver reflectors were next considered, but such surfaces are rapidly oxidized and cannot be used effectively. Aluminum, however, affords an excellent and permanent reflecting surface when properly processed. The C. M. Hall Lamp Co. produces reflectors by vaporizing alumi-

WHEN MILLING HAS TO BE DONE WITH SPEED, PRECISION, PROFIT



A 3K Milling Machine equipped with Model K Dividing Head and Tailstock — Gashing Slab Milling Cutter.

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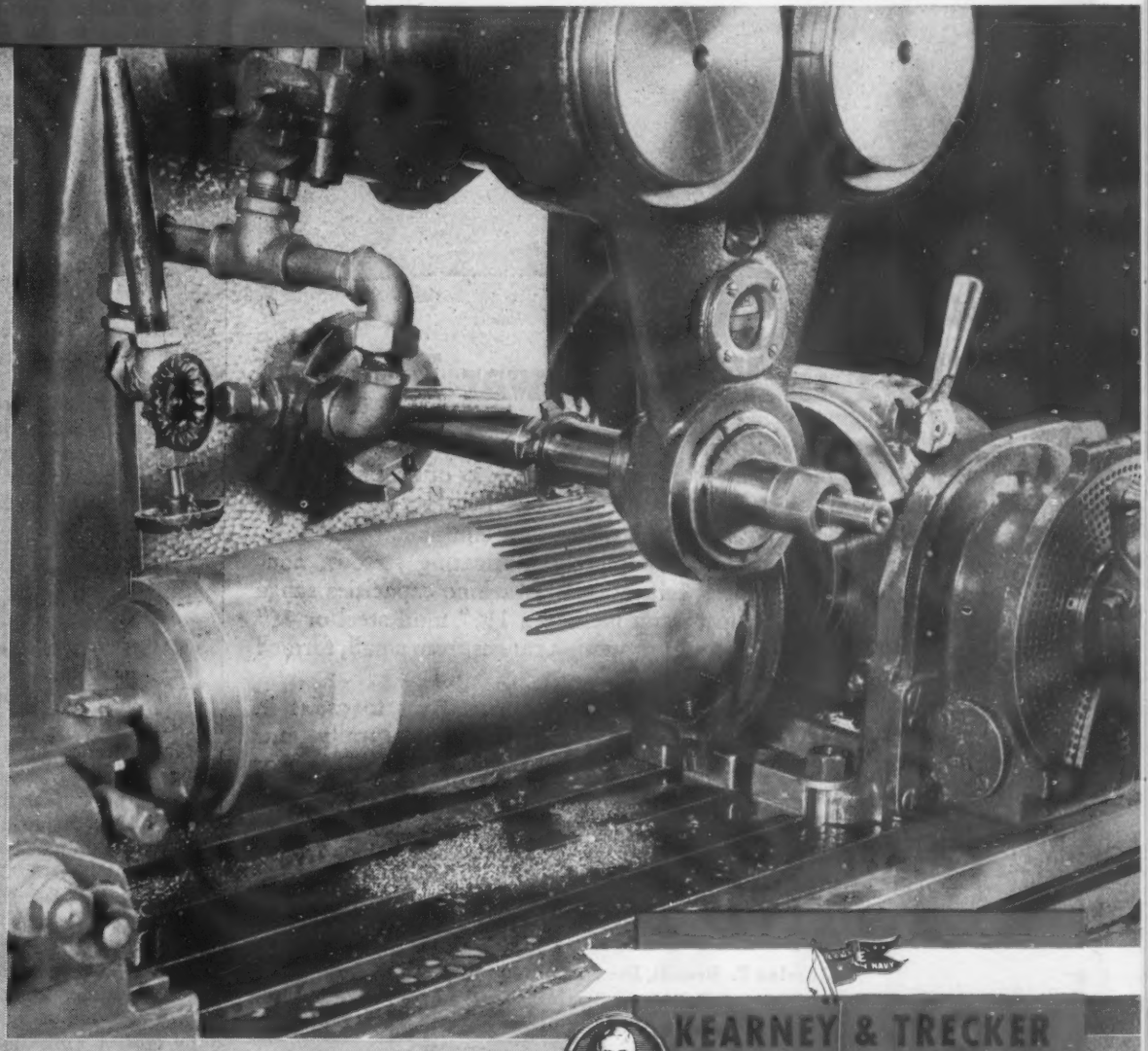
Write for new Bulletin K10 giving detailed and descriptive information on Model 2K and 3K Milwaukee Milling Machines.



Milling a worm gear in a spindle quill on a 3K Universal Milling Machine. Angular 7° spacing of cut is indexed with less than one turn of the index handle on the Model K Dividing Head.

Milwaukee Machine Tools

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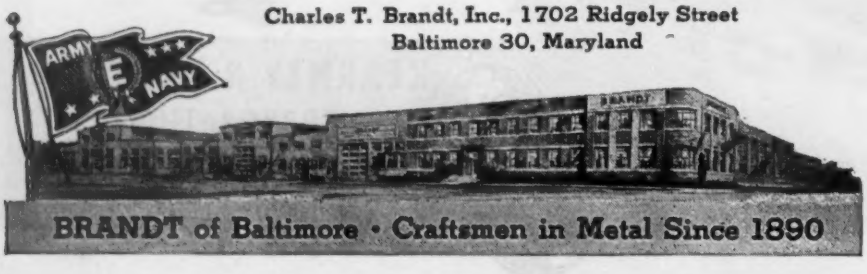

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num in a vacuum and depositing it in a thin film on a brass or steel shell. Brilliance of the surface is then protected by developing a thin film of transparent aluminum oxide which makes the brilliance permanent. Some of these reflectors have been used continuously for years with no reduction in efficiency.

First reflectors were parabolic in design. Later an elliptical contour was adopted to get wider distribution of the radiant energy. Today, most reflectors are a modified parabola being positioned in banks or groups to get the heat energy pattern wanted on the work.

During the past few years, the lamp manufacturers have been developing and improving a lamp known as the R-40 which embodies its own reflector. Because of its improvements, this lamp has been enthusiastically received and is expected within a short time to eliminate the need for auxiliary reflector equipment. This R-40 lamp is made in 125, 250 and 375-watt sizes.

Electrical Accessories: In early radiant heat equipment considerable trouble was encountered by the fusing of the lamp bases to the sockets. In addition wire connections oxidized and deteriorated rapidly because of being subjected to oven temperatures. All copper bearing materials, it was observed, were readily oxidized at such temperatures, reducing their current carrying capacity so much that they eventually became resistors instead of conductors of electric current.

During the course of development, it was found that mounting all electrical current carrying components, lamps and reflectors on the outside of the oven wall corrected this trouble because all current carrying parts and lamp sockets are kept out of the heated zone. Today, infra-red ovens utilize prefabricated standardized panels upon which the infra-red radiant heating units are mounted. Prefabricated standardized ducts are employed in the recirculating and exhausting systems. Thus, any oven arrangement desired can be constructed quickly and simply by assembling the prefabricated reflector panels and electrical components on a frame of the required size and shape.

One Oven—Miscellaneous Work: Instead of requiring a special radiant heating oven for each size, shape and thickness, Mr. Cusack points out that it is possible to design a single oven to handle an enormous variety of parts. On one installation, 0.026-in. thick sheet metal parts and ¼-in. castings, ⅛ to ¼-in. forgings of various sizes and color are being finished in the same oven. Variations in color, material and type of finish can also be accommodated. By employing certain optical principles and by correct utilization of radiant and derived convected heat, it is possible to bake finishes on any shape or size object.

Tests indicate that portable banks of lamps are entirely unnecessary in a correctly designed oven since distance from lamps to the work is not a critical fac-

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We get better welds and more of them since we bought "Bumblebees"

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- Absence of moving parts, tough, he-man construction and top-notch insulation assure dependable, trouble-free operation — eliminate shutdowns for repairs and replacements.

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- There's almost no "arc blow". You can work faster in any position and you're sure of good, sound welds every time.
- It's easy to produce sound, uniform welds in the corners and tight spots—there's less chipping out of welds.
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- The current setting is always plainly visible on the big easy-to-read indicator.
- They're dependable — don't require oiling or other attention. An operator can concentrate on welding.

- **These are a few of the important advantages which are making "Bumblebee" welders favorites in plants everywhere. Others are described in the "Bumblebee" Catalog. Ask your nearest Airco office for a copy or write Dept. S, Air Reduction, General Offices: 60 East 42nd Street, New York 17, N. Y. In Texas, Magnolia Airco Gas Products Co., General Offices: Houston 1, Texas.**

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tor, when lamps are properly arranged. The heating of differently shaped parts is facilitated in a correctly engineered infra-red radiant heat oven by the proper use of derived convected heated air and the conductivity of the material, which make it possible to heat portions of the work that may be partially shielded from direct radiation.

Many Advantages: Radiant ovens have a number of important advantages. They can be turned on, shut off, and have their temperature changed to a new value in a matter of minutes instead of hours as with conventional units. Too, in event of a short or prolonged lag in receiving work, the oven can be turned off, thereby saving fuel. Work in oven can be allowed to remain there without possibility of spoilage. The elimination of the warm-up period is extremely important in many plants.

Since they are light structurally, they can often be mounted overhead or on the wall where the floor space saved for other production operations can amount to a most significant figure. Their compactness allows them to be better co-ordinated with other processing as they can be built into the production line at any point desired. See Figs. 4, 5, and 7 where a complete dipping and baking installation is mounted overhead.

They are highly flexible, can easily be re-arranged to accommodate changing production requirements. They are free from variations that cause inconsistent results. Since their operation can be observed at all times, the progress of the work can be checked continuously.

Increase Capacity of Present Equipment: Mr. Cusack reports a number of plants have obtained greatly increased output by adding an infra-red section in front of their air oven. In such an arrangement, the infra-red section is utilized as the "heating" section in Fig. 3, with the convection oven as the "holding" section. In this way, one plant increased its output from 800 units per hour to over 2300, by merely adding a comparatively low cost radiant heating section. No additional floor space was required because the infra-red heating units were built around a section of the conveyor leading from one floor up to another on which the convection air oven was located, thus using space formerly employed merely for conveying.

This use of infra-red is widely applicable to plants that now have conventional air ovens and wish to increase their capacity. It can be done at comparatively little expense and makes a most efficient overall baking installation.

Triples Output, Saves $2880 a Month: An excellent illustration of what radiant ovens can do is found in the fan department of Hayes Industries, Inc., Jackson, Mich. Before the war, Hayes made automobile fans for Studebaker and Willys as well as all the General Motors models and all Chrysler models except Plymouth—some 250,000 to 275,000 per month. Fans are now being

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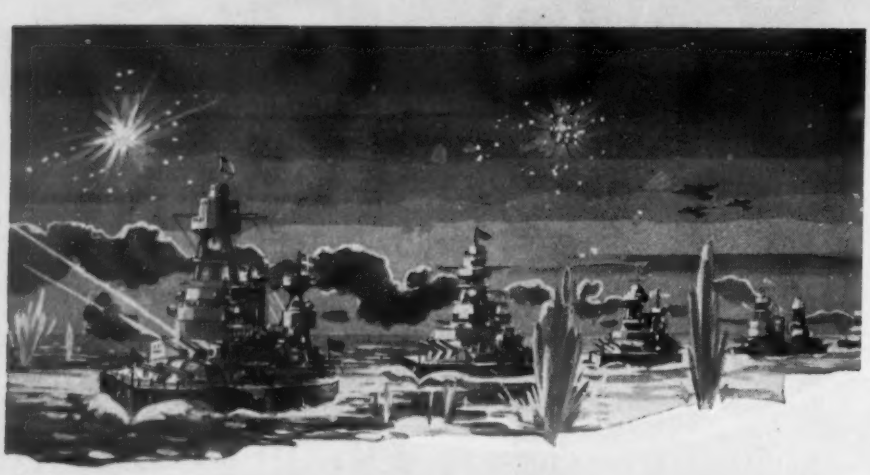

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made for General Motors, Yellow Truck & Coach, White and others. Postwar output of 350,000 units monthly is contemplated.

Here H. B. Strickling, superintendent, informs us that fans are made from sheet steel by first slitting to width required, subsequently trimmed to length. Flat pieces next are beaded, partially forming the contour; then formed to correct pitch on a double crank press; bolt and shaft holes pierced in a single operation; blades riveted together on a press; then trued up to get all blades in same plane. After balancing, the machine operator hangs the fan on a hook of the monorail conveyor which carries it through a degreaser and up to the roof where it goes through a dip tank and into the infra-red oven; then on out to the shipping department for packing.

Prior to the installation of the infra-red oven, however, a much more complicated series of operations was involved. While the same enamel was used, drying in a large gas-fired A-type oven was so slow that the enamel tended to slough or slide down one side, causing an unbalanced condition which required trimming and balancing AFTER baking. To protect the raw metal exposed by trimming, the fan blade edges then could only be brushed with enamel and allowed to air dry. Also, the arbor hole tended to fill up, requiring a reaming operation after baking.

This original setup required one man to load the conveyor, a second to remove work from the monorail and place it on the oven conveyor; a third to remove the fans from the oven. Now, the balancing machine operator places the fan on the conveyor as part of his work and only one man is required in the finishing operation itself, to unload the conveyor.

Another important gain was the elimination of a serious fire hazard which existed previously because the large gas-fired oven was located close to a 1000-gal tank of inflammable enamel. This was replaced with a 400-gal tank positioned to entirely eliminate all fire hazards. See Fig. 7.

A number of other important savings have been obtained in this installation. The A-type oven formerly used occupied a floor area of 24 x 12 ft, was 20 ft high at top. Conservative estimate is that floor space in this plant is worth $10 per square foot per month. Saving from this item alone thus is $2880 per month since the infra-red oven is overhead, uses no floor space. Dip tank, too, is overhead, producing another important saving in floor space. Actual overall saving in production costs is 17 per cent.

High Output: Production requirements called for the finishing of 7000 fans in 9 hours. Against former production of 770 fans per hour, the infra-red oven produces 2000 pieces of work per hour, almost triple the former output.

Radiant oven is 54 ft long, consumes

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The new high-solids lacquers can give twice the covering power of old-style lacquers . . . enable operators to complete more pieces in a given time . . . because they provide far thicker coatings when dried. Each coat now does the work of two! The answer is more solids, less solvent. Yet, despite the new finishing speeds and economies afforded, their durability and appearance are not sacrificed. For production line finishes on metal, wood, fabric, glass, rubber, leather, paper, plastics—use high-solids lacquers and save!

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Because perfect protection is so essential to a product so spotlessly clean, each year millions of pounds of steel and iron enameling sheets are wrapped in FIBREEN while in transit.

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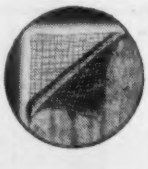
Protecting steel sheets is but one of many wrapping, packing, and shipping problems solved by FIBREEN, the tough, sisal-reenforced wrapping paper. For hundreds of manufacturers, it has cut time . . . saved labor . . . reduced costly crating, shipping, and handling charges. It may be the answer to some of your own shipping problems. *Why not investigate its possibilities.*



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1800 kw, handles fans for jeep, truck, tank and passenger car engines with fan sizes ranging from 12 to 26 in. in diameter—four, five or six blades. Oven u type R-40 250-w infra-red lamps.

Finish applied is a black baking enamel with a film thickness of about 0.005-in. Conveyor carries work through oven at a speed of 6 fpm, with carriers spaced 9 in. apart. Oven operates at a temperature of 400°F.

Fork-Type Trucks Facilitate Wire Handling

Handling a daily average of 250,000 lb of unfinished wire in coils, as well as other raw materials and finished products, has been expedited in the plant of a welding rod manufacturer by use of two fork-type industrial trucks, according to Elwell-Parker Electric Co., Cleveland. When received, coils of wire are stacked

side by side, almost vertically, in freight cars. Each prong of the truck fork engages five coils of wire. The load of 10 coils, weighing 2 tons, is conveyed to receiving bins adjoining machines which straighten wire, cut it to length, and eject rods into steel boxes with holes pierced near upper edges. Fork truck then takes loads of four boxes to next operation by means of hooks and short lengths of chain, as shown in accompanying illustration. Same trucks also are used for carrying packaged rods on pallets or skids and transporting them to cars or storage.

—o—

A hydraulic cylinder calculator for computing the different factors in hydraulic cylinder applications easily and quickly is offered by Hanna Engineering Works, 1765 Elston avenue, Chicago 22. It is said to eliminate the need for multiple tables, graphs, charts and data, giving instantly and accurately required values based upon other values in the same scale. Nineteen distinct operations may be performed on its scales, including cylinder size, pressure, cylinder speed, size of pump, valves, pipe and motor.

HELPFUL LITERATURE

1. Veteran Employment

American Veterans Association, Inc.—6-page folder entitled "JOBS for the War Veteran" explains responsibility placed upon industry to provide suitable jobs for disabled ex-soldiers. Possible solutions to many problems involved in hiring these men are outlined.

2. Alloy Heat Treatment

Peter A. Frasse & Co.—Data chart No. D 3 presents comprehensive analysis of heat treating procedures for standard SAE and AISI grades, including NE types. It summarizes proper annealing, normalizing, hardening, reheating and drawing temperatures, with recommended practice shown for each alloy analysis.

3. Gears

Foote Bros. Gear & Machine Corp.—66-page illustrated bulletin AQA is entitled "Aircraft Quality Gears." Quality comparison, material selection, gear design, classification, accuracy and other engineering data are given on complete line of gears.

4. Lubricant

Fiske Brothers Refining Co.—28 page illustrated Service Handbook-1945 Edition gives specifications of Lubriplate lubricants for all types of industrial applications. Advantages, applications and data on oil and grease types are presented.

Precision Gages

...al Products Corp.—Two illustrated bulletins are descriptive of model B-1 ...er-comparator unit and dial indicator ...p gages, respectively. Details are given ...arding design, operation and uses of these ...cision instruments.

6. Springs

American Locomotive Co., Railway Steel-Spring Div.—12-page illustrated bulletin No. 1001 entitled "Springs" cites case studies of design considerations involved in constructing helical compression, volute, helical extension, helical torsion, disk, special flat and other springs. Design data and physical properties are listed.

7. Blast Cleaning

American Foundry Equipment Co.—24-page illustrated catalog No. 74 explains purpose and application of Airless Wheelabrator airless abrasive blast cleaning equipment. Diagrams and tables are used to show features of this equipment which uses wide range of steel shot and grit abrasive for various types of cleaning operations.

8. Brass Rods

American Brass Co.—24-page illustrated bulletin No. B-14 describes Anaconda rods for screw machine products. Leaded and free-cutting brass, Everdur, phosphor bronze, hardware bronze, commercial bronze, nickel silver, copper and other alloy rods are listed. Properties, machining data, production cost factors, composition and other engineering information are presented.

9. Face Shields

Boyer-Campbell Co. — 4-page illustrated bulletin "The Hundred Series" describes line of safety face shields. Four different headgears are available, each with choice of three thicknesses and three sizes of cellulose acetate windows, or three sizes of 24-mesh screen windows for heat protection, and fiber front for scarfing and welding.

10. Actuating Unit

Askania Regulator Co.—4-page illustrated bulletin No. 120 describes new power unit which is designed to extend range of uses for air-operated controllers. It is actuated primarily from air loading pressure of air-operated controller and employs hydraulic operation to control heavy valves and dampers.

11. Power Lift Truck

Automatic Transportation Co.—4-page illustrated condensed catalog folder No. 1001 gives details of Transporter electric propelled lift truck of platform or fork type for handling industrial materials. All controls are incorporated in handle and truck is easily manipulated.

12. Gages & Indicators

B. C. Ames Co.—56-page illustrated plastic-bound catalog No. 53 and price list covers gages and dial indicators for measuring, size control and general testing. These precision instruments and testing equipment are available in wide range of capacities for all types of checking operations.

13. Water Works Equipment

American Well Works—Six illustrated bulletins Nos. 246, 247, 248, 252, 255 and 256 are descriptive of two-stage centrifugal pumps, deep well turbine pumps, double suction pumps, iron and carbon dioxide removal units, flocculation and mixing equipment and Flocsettler water conditioning equipment, respectively.

14. Fire & Safety Aids

General Detroit Corp.—48 page illustrated catalog No. 20 describes complete line of fire fighting, first aid, industrial maintenance, safety and alarm equipment for commercial and industrial applications. Reference material is presented to aid in selection of equipment for any given hazardous condition.

15. Rectifiers

Fansteel Metallurgical Corp.—12-page illustrated bulletin No. RDP-107 is engineering manual and specification book on standard elements of selenium rectifiers. Principles, properties and construction of wide range of sizes and types of units are described.

16. Socket Wrenches

Apex Machine & Tool Co.—106-page plastic-bound illustrated catalog No. 18 gives specifications and other data on complete line of socket wrenches for production purposes. Plain sockets, socket adapters, straight wrenches, Allen drivers, universal sockets and adapters, and universal wrenches are listed. Sizes and types are available for practically any requirement.

17. Cutting Tools

Crobalt, Inc.—4-page illustrated bulletin on Powersteel cutting tools gives dimensional and application data on these alloy tool bits which are hardened and ground, ready for use. Standard sizes and list prices of square and rectangular bits are given.

18. Power Transmission

Dodge Mfg. Corp.—20-page illustrated bulletin No. A-242 is supplement to "Power Transmission Catalog No. 42." Additions to line include pillow blocks, flange bearings, rolling grip friction clutch and cut-off couplings. Price changes and corrections are included.

19. Distribution

Graybar Electric Co.—28-page illustrated bulletin "Tomorrow's Electrical Distribution—Via Graybar" tells how company applies modern wholesaling and merchandising methods to distribute electrical equipment. National network of sales offices and warehouses is explained.

20. Production Facilities

A. W. Hecker—28-page illustrated spiral-bound bulletin "Men and Machines for Engineering, Tool Building and Production" describes engineering, design and production facilities of this company which specializes in making tools, jigs, fixtures and machine parts.

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21. Magnetic Ingot Iron

American Rolling Mill Co.—24-page illustrated bulletin "ARMCO Magnetic Ingot Iron for DC Applications" explains properties of this material which is adaptable for electrical and magnetic applications ranging from magnetic cores of cyclotrons to telephone and telegraph wires. Fabrication, machining, welding and other data are included.

22. Variable Speed Drive

American Pulley Co.—4-page illustrated bulletin No. SJ-44 presents design and application data on Speed-Jack drives. These variable speed transmission units are adaptable for drivers rated at up to 1 horsepower.

23. Pyrometer Controllers

Bristol Co.—16-page illustrated bulletin PB1226 describes Pyromaster pyrometer controllers of electric type. Microact controllers, proportioning controllers and current input controllers are covered. Typical applications, wiring diagrams and other data are presented.

24. V-Belts

Diamond Rubber Div., B. F. Goodrich Co.—4-page illustrated folder on Diamond wire grommet V-belts explains construction of these power transmission units and outlines their usefulness in handling difficult transmission problems.

25. Bearing Application

New Departure Div., General Motors Corp.—24-page illustrated New Departure engineering service data book is part I of series on fundamentals of ball bearings. Entitled "Bearing Application", this manual deals with principal ball bearing types and fundamentals of mounting.

26. High Frequency Heating

American Type Founders—4-page illustrated bulletin describes ATF Hi-Frequency converter for induction heating applications. Available in 15 and 30-kilowatt capacities, these units are adaptable for brazing, soldering, hardening, annealing, melting and normalizing.

27. Lathe Converter

Master Mfg. Co.—78-page illustrated catalog No. 10 is combination operating and maintenance manual and spare parts catalog on Master lathe converters which include basic milling units, internal and external grinding heads, 90-degree milling head, internal keyseater, arbors, dividing head and other accessories. With these attachments, wide range of machining operations can be performed on lathe.

28. Nonmagnetic Steel

American Manganese Steel Div., American Brake Shoe Co.—32-page illustrated bulletin No. 1144-NM is entitled "Non-Magnetic Applications for Amsco Manganese Steel." Properties and typical uses of this material are covered.

29. Gear Finishing

Colonial Tool Co., Ltd.—8-page illustrated bulletin No. E-45 describes specialized line of rotary and rack type gear finishing cutters, laps, burnishers and master checking gears. Information is given to assure selection of correct tool for specific type of work.

30. Drum Dryers

Louisville Drying Machinery Co.—8-page illustrated bulletin No. 250 describes General American drum dryers for removing moisture from liquid materials to obtain dry products. Dimensions of various units are listed.

31. Flash Welding

American Welding & Mfg. Co.—4-page illustrated folder entitled "Flash Welding—A Solution to Assembly of Forged Parts" describes advantage of this method. Typical assemblies are shown.

32. Chemical Products

Hercules Powder Co.—48-page illustrated bulletin "Labors of War for Peace" contains series of full-color reprints of advertisements which review products developed by company and which have profound effect on living conditions and on industrial progress.

33. Hose Clamps

George K. Garrett Co.—4-page illustrated bulletin No. 110 shows typical applications of Diamond Multi-Clamps for automotive, hydraulic, pneumatic, aviation and general plant hose connection service. Sizes and prices are listed.

34. Color in Industry

Pittsburgh Plate Glass Co.—24-page illustrated bulletin "Color Dynamics" explains scientific utilization of energy in color to promote efficiency in industry. Selection of proper color for various parts of machines and throughout industrial plants to minimize fatigue and accidents is outlined. Applications to machines, walls and ceilings, floors and aisles are described and shown.

35. Hydraulic Valves

Galland-Henning Mfg. Co.—16-page illustrated bulletin No. 88-A describes line of Nopak valves for control of air, water, gas or oil pressures up to 250 pounds per square inch and hydraulic valves for pressures up to 500 pounds per square inch. Models are shown for all types of control application.

36. Industrial Brushes

Fuller Brush Co.—62-page industrial catalog No. 10 describes line of brushes for maintenance and other purposes in industrial plants. Brooms, floor brushes, dusters, scrub brushes, bench brushes, whisk brooms and other types are listed.

37. Welded Assemblies

Ampco Metal, Inc.—4-page illustrated bulletin No. 67 describes facilities of company for producing assemblies made of bronze sheet, castings or extruded parts welded with Ampco-Trode aluminum bronze weld rod. Types of assemblies are shown.

38. Magnesium Castings

Superior Bearing Bronze Co.—4-page illustrated bulletin "Magnesium Castings" contains facts for design engineers and production men on design and application of products employing this metal. Comparative properties of magnesium and other structural metals are tabulated.

39. Gas Analysis Apparatus

Burrell Technical Supply Co.—96-page illustrated catalog No. 80 contains complete data on gas analysis apparatus. Included is technical section which serves as manual for gas analysts. All apparatus is described and details are presented on proper use of equipment.

40. Electric Products

BullDog Electric Products Co.—84-page illustrated condensed catalog No. 451 presents details on complete line of safety switches, range panels, wire and cable duct, lighting panels, fuse panels, switchboards, circuit breakers and similar electric products.

41. Heat Treating

Claud S. Gordon Co.—8-page illustrated broadside on "McKee Eclipse Heat Treating Equipment" describes pot furnace atmospheric type burners, oven and shop furnaces, metal melt units and other heat treating and auxiliary combustion equipment.

42. Soundproof Phone Booth

Burgess Battery Co.—4-page illustrated bulletin No. 149 describes Acousti-Booth telephone booth which provides zone of quiet for telephoning in noisy locations. Industrial model No. 204 is of steel construction and is designed for use in steel mills, foundries, machine shops, metal working plants and other locations where noise of equipment and machines frequently makes telephoning from open telephone impossible.

43. War Products

American Machine & Metals, Inc.—12-page illustrated booklet "1944 in Review" relates story of operations of company in production of implements of war and machinery and parts to be used in manufacture of weapons, ammunition, medicines, food, clothing and other equipment and supplies used by armed forces.

STEEL
1213 West Third St., Cleveland 13, Ohio

8-6-45

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Readers' Service Dept.

West Coast Steel Mill

(*Continued from Page* 133)

bending upon a mandrel as specified. Each loaded car of wire is tagged as to size, grade and coil number for identification with original tests. Finished wire at this point may be galvanized, bright welding, spring, rope, gravel screen, or bright basic wire, some of the latter for stud and bolt use.

About 1400 types of nails generally are made. The Pittsburg Works wire mill produces 1200 varieties of them, indicating the tremendous diversity of work at Columbia Steel. The range of nails produced is from ½-in. diameter by 8-in. down to 22-gage (0.028-in.) diameter by ⅜-in. There are 189 nail machines with speed range from 115 to 600 rpm. All the newer machines (about 100) have individual motor drives.

After cutting, the nails are delivered to the nail finishing department for the removal of whiskers, cleaning and packing. The cleaning equipment is most modern.

Each cleaning unit consists of a mechanical loading skip hoist, a wet cleaning drum in which the nails are cleaned in a hot caustic solution and their whiskers removed through the tumbling action, and drying drums heated to 200° F and containing sawdust. These drums discharge onto a small shaker where the sawdust is removed by vacuum suction, and thence to a large shaker table where the nails are shaken down in kegs for space saving. The system is served by continuous conveyor — as soon as one batch is removed from the wet drum, it is reloaded with another. The normal batch is 40 kegs of 100 lb each.

Nails Carried By Conveyor

If the nails are to be cement coated, they are taken by separate conveyor from the small shaker to the coating drum, and thence back to the large shaker table for packing. After the nails have been loaded in kegs, they are placed on a power-driven conveyor and delivered to the exact weighing scales. The head is then placed on the keg, and by another conveyor they are fed to the nailing machine and loaded onto the steel pallet holding 25 to 30 kegs. Removed from these by an electric high lift fork truck after head nailing, the kegs move into storage, each pallet being double decked and racked five high.

Columbia Steel has placed kegmaking on a production line basis. Staves, heads and the steel chimes are bought outside, wire hoops for the kegs being made in the plant. The components are assembled by hand on setup benches and placed on a conveyor. Chimes are placed on each end of the keg, the wire hoops are installed around the body and the keg is automatically fed into the trussing machine for exact placement of chimes and hoops.

The keg is automatically discharged

Saves the extra cost of a special machine

. . . by adapting a standard Delta tool

This manufacturer benefits from an ingenious, money-saving production idea, typical of what you can do along these lines:

1. Use standard, low-cost Delta components to build high-production, special-purpose machines — quickly convertible to other uses when requirements change.

2. Modernize your present machines that are rapidly approaching obsolescence, by replacing worn elements with regular, stock-model Delta components.

3. Utilize the portability and compactness of Delta-Milwaukee Machine Tools, to revise or supplement production-line layouts for more efficient operation.

This is representative of production ideas that get results in hundreds of plants which employ Delta's modern, flexible approach to tooling, on a wide variety of operations.

Delta's savings in cost, weight, and space are due to modern production methods applied to a large volume of standard models — not to short-cuts in quality.

Low-cost Delta-Milwaukee Machine Tools and the ingenuity of your engineers provide a working combination that results in fast, flexible, economical solutions to production problems.

Delta MILWAUKEE Machine Tools

● By adding a special fixture to a standard Delta-Milwaukee Shaper, J. I. Case Co., Rockford, Ill., solved the problem of shaping magneto timing cams without the delay and heavy capital investment involved in installing an elaborate special machine for the purpose.

Using minimum floor space, this ingenious set-up accurately shapes cams to exact tolerance of .0005". Thus a $35.00 machine does a job ordinarily done by a grinding machine usually costing about $1500.00. The addition of a special fixture is required in either case, so the fixture cost remains the same. MA-23

Delta's 76-page Blue Book provides 140 case histories of war-production experience, to help you more clearly visualize the flexibility of portable, compact Delta-Milwaukee Machine Tools. Also available is a catalog of these low-cost machine tools. Request both, using coupon below.

Tear out coupon and mail today!

THE DELTA MANUFACTURING CO.
702H E. Vienna Ave., Milwaukee 1, Wis.

Please send me my free copies of Delta's 76-page Blue Book and catalog of low-cost machine tools.

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Schloemann "MOTOR-ROLLERS"

Increase MILL TABLE EFFICIENCY

SCHLOEMANN engineers have designed "Motor-Rollers" to increase efficiency and lower operating costs by simplifying electrical and mechanical requirements.

Each Schloemann "Motor-Roller" is individually powered by a squirrel cage motor, housed in a free turning shell on anti-friction bearings, assuring flexibility of movement. The stator has no electrical connection to the rotor and represents the simplest piece of apparatus for converting electrical energy to mechanical work.

Our engineering staff is prepared to assist you with your mill table problems. We invite your inquiries for additional information or consultation with our representatives.

"Motor-Roller" installation in a shear depressing table.

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Complete Hydraulic Systems • Extrusion Presses

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1105 Empire Building Pittsburgh 22, Penna.

HYDRAULIC PRESSES • ROLLING MILL MACHINERY

from trussing to another conveyor and delivered to the nailing machine where four nails and eight staples are automatically driven. This machine drives two staples and one nail in a single operation, four times around the keg, production being 3120 kegs per 8 hr. The machine cuts and drives the staples in the same operation. It is electric powered, the keg being inserted on an anvil. Rotation is automatic. When finished, kegs are automatically conveyed to mezzanine storage and from there, automatically redelivered to the nail cleaning line on another conveyor as required.

Blue nails are sterilized at 600° F. These are used principally by lathers and tackers where they must be sterile since the user will "mouth" them. This sterilization is accomplished in the bluing furnace, serviced by skip hoist. From it, work goes into a cooling drum or to a conveyor and on to the keg filling mechanism.

Nails Made By Hot Rumbling

Galvanized nails are made by hot rumbling. This equipment consists of a furnace with a rotating shell having internal vanes for direction of agitation. This hot-rumble shell is charged with cold nails and rumbled while heating with flake zinc and flux (sal ammoniac). Shells for this purpose are made in the company's foundry. The nail charge is 300 lb. The rotation is horizontal. The cycle is 10 to 12 min. After coating, the nails are discharged on to a conveyor belt running into flowing water and from there to a drying drum with sawdust. They are finally discharged onto the shaker table where the sawdust is removed by vacuum suction and thereafter the nails are kegged. The flaked zinc is prepared at the galvanizing station in an independent furnace directly from pig spelter.

The wire mill maintains a small package department for brads, tacks and flat head nails, making packages from 100 lb down to 2-oz packages.

The capacity of the local nail warehouse is 250,000 kegs, Columbia Steel being the largest producer of nails on the West Coast. The demand in this section is heavy because of the large requirements in crating vegetables and fruit. The wire specialty department of the mill consists of facilities for straightening and cutting; making woven wire fence, poultry and fish trap netting, barbed and twisted wire, and springs.

The wire rope mill, housed in a 1000-ft building, went into production in 1941. Here are produced many varieties of wire rope from the smallest of $\frac{1}{8}$-in. diameter 7 x 7-construction aircraft cord, to a maximum of 3-in. diameter 6 x 37-construction steel wire rope. Constructions such as 6 x 7, 6 x 19, 6 x 37 (bright and galvanized), track cables, commercial galvanized strands, sounding line, and stone sawing strand are typical of the output of this mill.

Production flow is to receive the wire

A few simple rules to conserve carbide tools

FIRTHITE FIELD SERVICE POSTERS are available for display in your plant

The conservation of carbide tools through proper handling and correct usage is essential not only in war time but at any time for best production results and low operating costs.

These Firthite field service posters will help remind your plant operators in simple, easy-to-take, understandable manner, of the right way to make carbide tools do their utmost.

Fill in and mail the coupon for your set of these free, 17" x 22", four-color posters.

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FIRTH-STERLING STEEL CO., Dept. S—McKeesport, Pa.

Please send us without obligation on our part_____sets of Firthite Field Service Posters which we wish to display in our plant shops.

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Production Screwdrivers

Speed up

YOUR SCREWDRIVING ASSEMBLIES BY USING THESE MACHINES

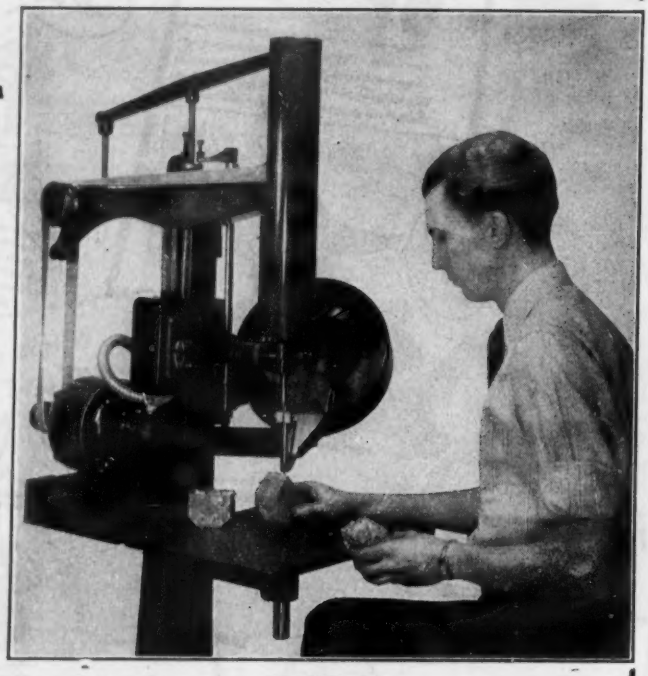
Model B Will Drive Screws From No. 6 to No. 1/4, in Lengths 3/16 to 1 1/2 Inches

●

All Screws Driven to a Uniform Tension

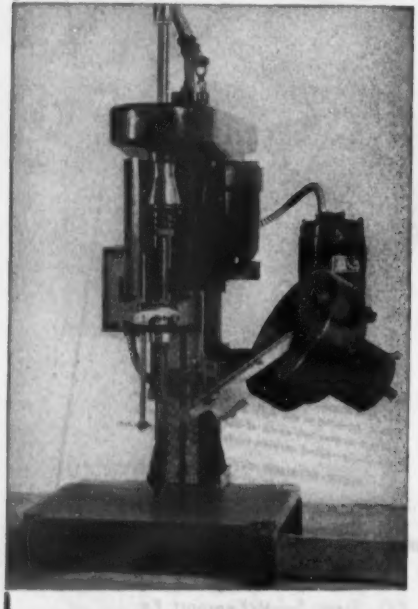
●

No Marring of Heads



MODEL B

MODEL A



Model A Is Designed to Handle Small Screws in Sizes From No. 2 to No. 6 In Lengths From 3/16" to 3/4".

●

Driving Time One Second Per Screw

●

Send Sample Assemblies for Production Estimates and Quotations

ASK FOR CATALOGUE

Detroit Power Screwdriver Co.

2813 W. Fort St., Detroit 16, Mich.

by plant rail delivery to weighing to wire storage on steel skips and hence to spooling. There are seven spooling benches. Five have nine blocks, one has ten, and one has three blocks, the purpose of which is to place the wire on the appropriate spool for the machine upon which the wire is to be stranded. The range of wire spooling is from 0.0065 to a maximum of 0.260-in. diameter.

After being filled, the spools are placed on gravity runways and are delivered to the stranding machines. Each spooling bench is driven individually with an electric motor with facilities for starting and stopping the individual blocks. A distributor bar on each bench controls the feed. The automatic 9-block spooling benches can be controlled at the bench or at the swifts. Each spooling bench is equipped with two overhead 600-lb electric hoists, one being used for placing coils on the swifts, the other to raise or lower the empty spools to and from the spooling bench. Electric buttwelders are used to pin wires together.

Machines Operate in Tandem

Large diameter 6 x 19-construction ropes are stranded on one of two 25-wire horizontal planetary-type stranders. When rope constructions having more than 25 wires per strand are needed, the two 25-wire planetary machines are coupled together in tandem. Ropes or track strands having a maximum diameter of 3 in. may be stranded on this equipment.

For stranding smaller diameter ropes the mill is equipped with 14 tubular-type, horizontal stranders. Individual 500 to 1000-lb capacity hoist are installed over the above equipment. Stranders are so located that upon completion of the stranding operations the full spools require but little handling to transport them to the closing machines (layers).

The mill is equipped with an 18-ton vertical planetary layer having six cradles, which is used for laying 6-strand ropes of 1⅛ to 3 in. diameter. Six and eight-strand ropes from ⅝ to 1⅛-in. diameter are laid in a 15-ton horizontal layer having nine cradles. Some special ropes are laid on a 7-cradle horizontal machine having a 40-ton capacity. All 6 and 8-strand ropes from ⅜ to ½-inch diameter, inclusive, are laid in a 9-cradle horizontal tubular machine which is used as both a stranding machine and layer.

After the strands have been laid into rope at the layers the finished rope, which has been automatically spooled on wooden reels during the laying operation, is moved by overhead crane to the shipping department, from where it is shipped by rail or truck to its destination. The warehousing department, is equipped for cutting the rope, re-reeling, and splicing. Wire rope slings of all types are made to customer's order.

A modern reelmaking shop is located next to the warehouse, for producing the

Pouring a double Thermit weld in fabricating a ship stern frame.

A Lesson from a VICTORY SHIP

Thermit welding's speed and effectiveness have been utilized in fabricating separately cast sections of the huge stern frames of Victory ships built for the U. S. Maritime Commission.

The application is one of the shipyard success stories of the war. It provides a worthwhile lesson for foundries and those who produce heavy machinery and equipment. Thermit welding of smaller castings, forgings and flame-cut shapes into large units, has many advantages. These include: minimizing the possibilities of flaws likely to occur in very large castings, saving pattern work and simplifying handling and shipping.

The Thermit process is also used extensively for the repair of large crankshafts, pinions, rolls, machine frames and other heavy parts, with considerable savings in production time and replacement costs.

Write for a copy of "Thermit Welding" or consult Metal & Thermit Corporation, 120 Broadway, New York 5, N. Y., Albany, Chicago, Pittsburgh, So. San Francisco, Toronto.

Thermit Welding

A Tungtip Cutter For Every Job
Turn to the pioneers in Tungsten Carbide milling cutters to find a Tungtip tool for every cutting job. Face mills, slab mills, end mills, side mills, staggered-tooth slotting cutters, inserted-tooth mills, saws.
Our experience in high production cutting will help you. Give us your problem... get our recommendations.
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TOOLS DIVISION
DETROIT, MICHIGAN P. O. BOX 1027
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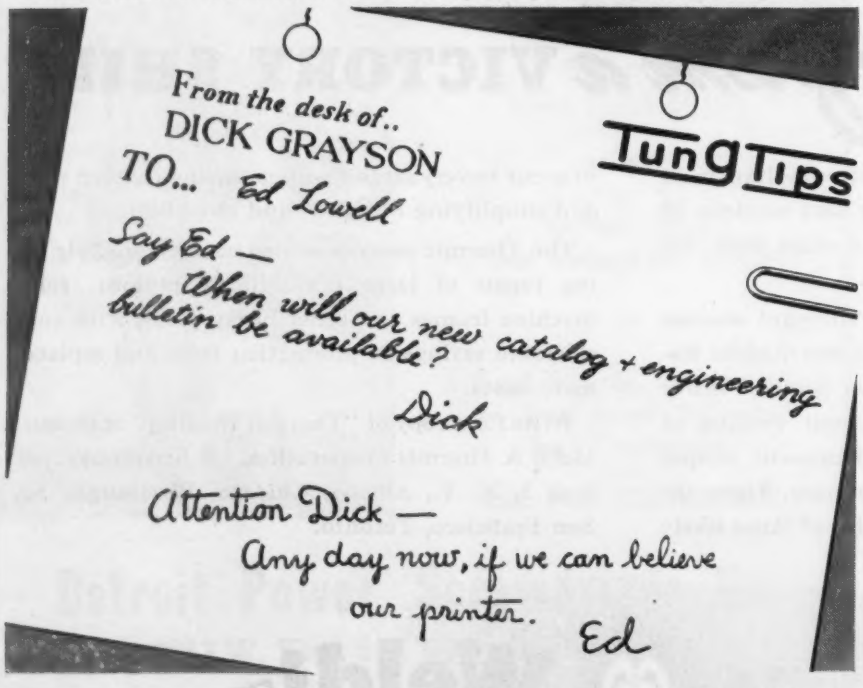


wooden reels upon which the rope is spooled prior to shipping. In addition, a fully equipped machine shop is maintained in the rope mill for making minor repairs. Major repairs are made by a larger centrally located machine shop. The quality of the wire rope and strand products is constantly checked in the testing laboratory.

Dynamometer Tests Airplane Tires and Brakes

A dynamometer for testing airplane tires and brakes has a total weight of more than 250 tons and took more than 1½ years to construct and install. Most of the electrical equipment to operate this machine, made by Adamson Machine Co., Akron, O., is manufactured by Westinghouse Electric Corp., Pittsburgh, Pa.

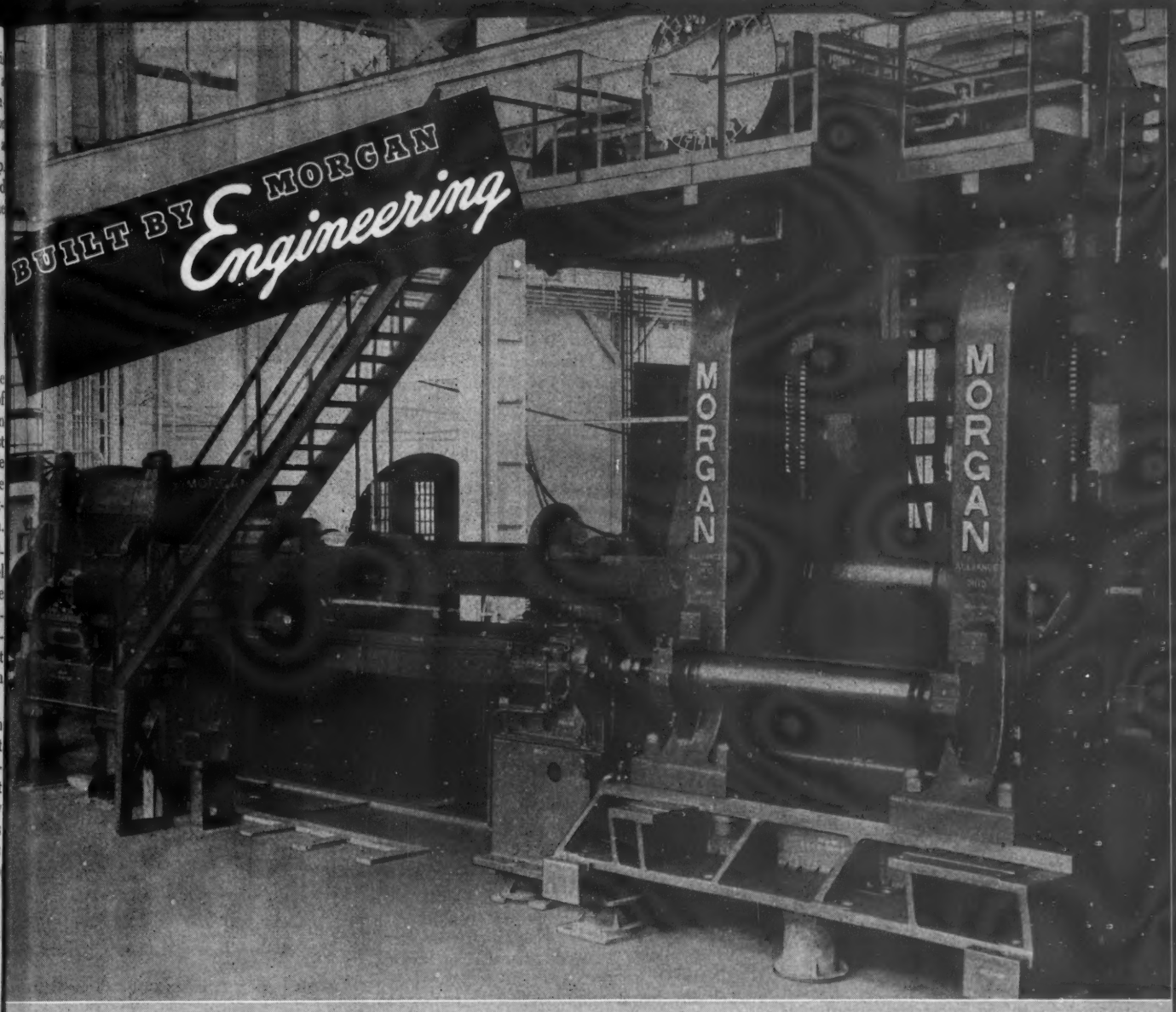
The heart of this equipment, a 158-ton wheel, is called an inertia wheel due to its resistance to change. On the front and rear of the wheel is a mounting axle for an airplane wheel, so connected with compressed air cylinders that each can be smashed into the inertia wheel with terrific force.

Outside the caged chamber in which the tests are conducted a large amount of electrical equipment goads the inertia of the immense wheel and sets it spinning at its rapid pace. Directly driving the axle on which the wheel is mounted is a 400 hp dc motor. It pulls for a period of about 30 min to get the circular mass moving at a speed of 308 rpm. At this speed, engineers estimate, the wheel, if freed from its moorings, would crash through the steel and brick structure which houses it and roll on for several miles, flattening trees and houses and anything coming in its path.

This tire and brake testing machine was designed as an accurate simulation of airplane landing conditions. Surface speed of the huge inertia wheel duplicates the forward speed of the airplane as it comes in for a landing. The force with which the tire and braking wheel are smashed against the inertia wheel approximates the drop of a landing airplane. The simulation on this laboratory tester is projected into the future, for the test on tires and brakes is more severe than tests under actual landing conditions.

Under the concrete floor of the aircraft laboratory which supports the inertia wheel are tunnels carrying wires, oil pipes and air lines. Removal of floor plates reveals a room with large tanks of compressed air as well as other equipment subsidiary to the operation of the tester. The 8-ton steel shaft carrying the inertia wheel was forged, X-rayed for possible flaws and given a series of tests.

Electrical equipment to give control to the equipment it motivates surrounds the caged dynamometer. Alternating current operates a 450 hp motor driving a 300-kw generator which changes alter-



MORGAN "36" TWO-HIGH BLOOMING MILL

Above is shown a Morgan 36" Two-High Blooming Mill on erecting floor. Housings are one piece steel castings of the closed top type. Top roll balance is of the counterweight type. Top roll lift sufficient for rolling 42" wide slabs. Manipulator is of the overhead type, compact and accessible. Tables are of heavy design, equipped with anti-friction bearings.

With this Mill was furnished Auxiliary Equipment as follows — Front and Rear Tables with Manipulator — Approach Table — Ingot Buggy — Runout Tables — Slab Shear with Gauge — Crop Hoist — Pushers — Conveyor — Skid Bed and Furnace Tables.

THE MORGAN ENGINEERING CO.

ALLIANCE, OHIO. 1420 Oliver Building, Pittsburgh

DESIGNERS • MANUFACTURERS • CONTRACTORS • BLOOMING MILLS • PLATE MILLS • STRUCTURAL MILLS • ELECTRIC TRAVELING CRANES • CHARGING MACHINES • INGOT STRIPPING MACHINES • SOAKING PIT CRANES • ELECTRIC WELDED FABRICATION • LADLE CRANES • STEAM HAMMERS • STEAM HYDRAULIC FORGING PRESSES • SPECIAL MACHINERY FOR STEEL MILLS

Grinding Questions Answered

By ALLEN STEELE
Manager, Dayton Grinding Wheel Division
SIMONDS WORDEN WHITE COMPANY

Presented as a practical aid in the solution of many common grinding problems. Readers are invited to send in their own grinding questions, without obligation. All questions will be answered by mail or in this column.

Continued from Previous Issues

24 Q. *"How many different kinds of coolants are there? It seems to me there is a new one every day."*

A. There are a great many different brands of grinding fluids or coolants and no doubt all of them differ in one way or another. Basically, however, all grinding fluids can be classified somewhere within the following types: (1) Plain water; (2) plain soap solutions; (3) straight mineral oils; (4) plain water and sodium carbonate; (5) emulsions of oil and water; (6) emulsions of paste compounds.

25 Q. *"What is meant by the term 'outboard roller support' method in infeed centerless grinding?"*

A. The term outboard roller support method in infeed centerless grinding is applied to work where the piece is longer than the width of the wheels and is ground but a short distance from the ends. The protruding end of the work is supported by the means of rollers which are generally outside the machine. These rollers are called "infeed roller work rests" and are considered a part of the fixture. The operation cycle is the same as for ordinary infeed grinding.

SECOND EDITION READY—*FREE!*

101 "Answers" to everyday grinding problems—indexed for quick, easy reference—

DAYTON GRINDING WHEELS

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SIMONDS WORDEN WHITE CO.
714 Negley Place, Dayton 7, Ohio

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nating to direct current to operate the 400 hp motor connected with the shaft of the inertia wheel.

Behind this operation a Rot-o-trol regulator determines power needs for continuous acceleration and regulates the electrical drive so as to provide a constant accelerating force. It can be used for regenerative braking, a process in which motors are connected to become generators acting to retard the speed of the inertia wheel. It also automatically keeps voltages in the motor and generator the same so that power, once cut off, can be connected back again while the inertia wheel is still in motion.

Large panels of switchgear give operating engineers fingertip control of the equipment. Other panels show engineers the ability of the brake to stop the bomber and the wire to withstand wear and tear.

This equipment with its 16-ft. inertia wheel is said to be capable of testing tires and braking wheels even larger than those in common use today.

Lightweight Plastic Bands Support 30-Ton Plane

A few pounds of Lucite methyl methacrylate resin will support as much as 30 tons of aircraft, according to the manufacturer, E. I. du Pont de Nemours & Co. Inc., Wilmington 98, Del. Circular bands of the product, 3 in. in diameter, ¼-in. thick, and 3 in. wide, were designed by the San Bernardino, Calif. Air Technical Service Command to protect intricate mechanisms of landing gear on stored planes. Bands consist of two half-circles of Lucite, held together in assembly by a wrap lock.

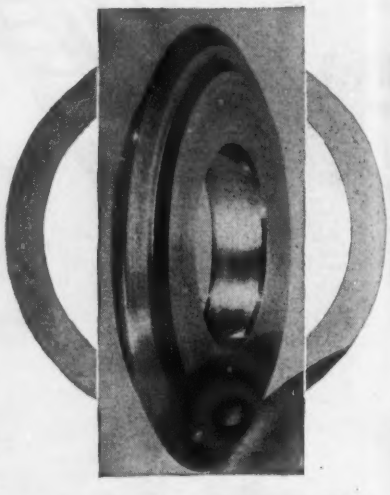
Clamped around the plunger of the landing gear strut, band acts as a stop, supporting the weight of the plane and preventing the hydraulic piston from resting against the cylinder head as hydraulic pressure of landing gear is deflated. This prevents damage to the piston and cylinder and jamming of packing. Strength of the plastic is said to assure its holding up the weight of the plane and its transparency to permit checking of hydraulic fluid.

Electric Equipment Improves Mining Operations

Electric mining equipment is being manufactured by General Electric Co., Schenectady, N. Y., for Maumee Collieries Co.'s new open pit coal mine near Jasonville, Ind. Totaling the equivalent of approximately 7000 hp, this operating machinery will be installed in one of the world's largest draglines and will make possible open cut mining at a depth of from 40 to 70 ft.

Equipment includes amplidyne control, with two heavy-duty, multiunit motor-generator sets, arranged for variable-voltage operation, supplying power

MAKE SLITTERS *and many other* RING-SHAPED CUTTING TOOLS OF



TOOL STEEL TUBING

This slitting tool was made simply by sawing off a thin ring of tool steel tubing and machining a cutting edge to the required angle. Use of this material eliminated the costly and time-consuming boring operation. Write for details.

Our 25th Anniversary

FREE DATA

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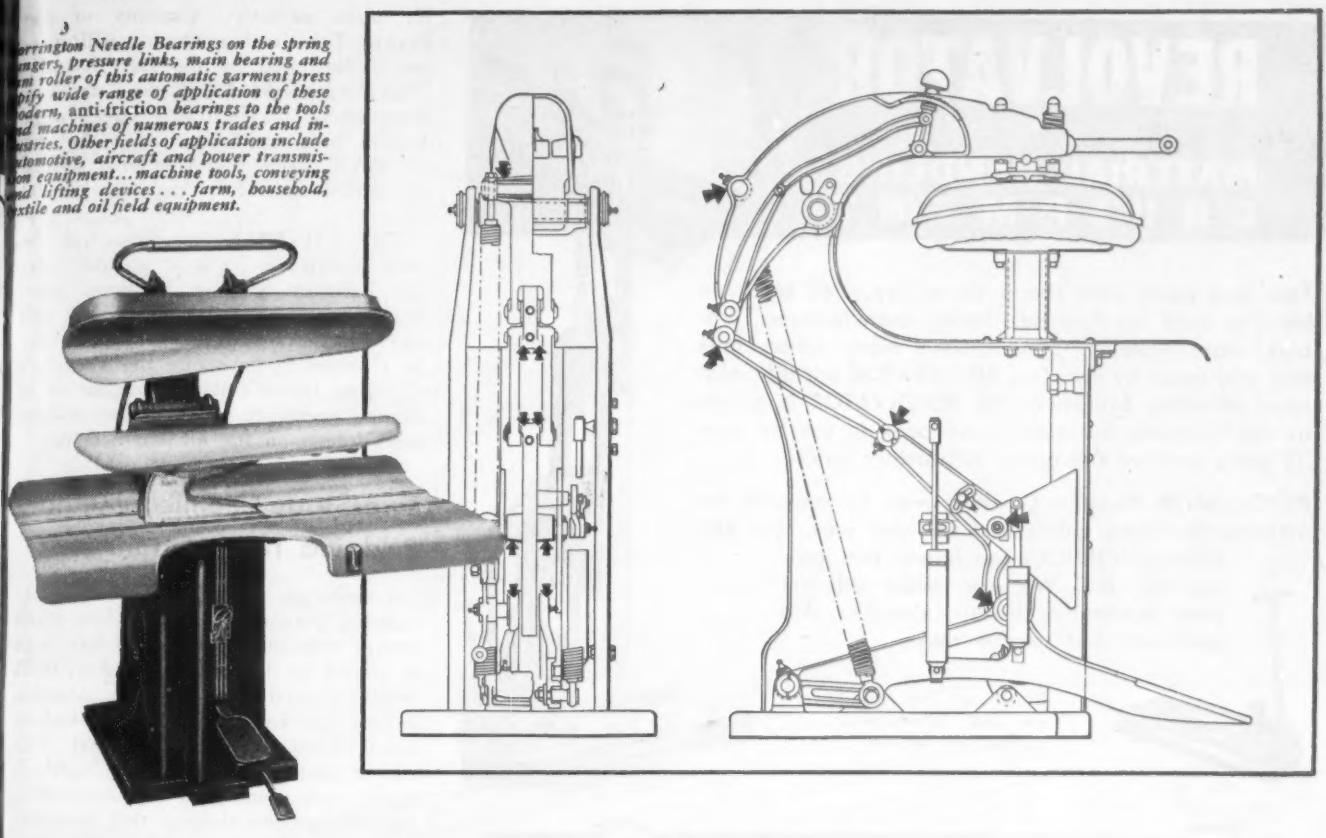
Torrington Needle Bearings on the spring fingers, pressure links, main bearing and cam roller of this automatic garment press typify wide range of application of these modern, anti-friction bearings to the tools and machines of numerous trades and industries. Other fields of application include automotive, aircraft and power transmission equipment... machine tools, conveying and lifting devices . . . farm, household, textile and oil field equipment.



Torrington Needle Bearings Help Increase Operating Efficiency of Power Garment Presses

Indicative of the wide range of efficiently-lubricated Torrington Needle Bearings in uses for modern equipment are several interesting applications on the laundry and dry-cleaning machinery made by the Prosperity Company, Inc.

On the leverage mechanism of the automatic press shown above, for example, ten compact, high-capacity Torrington Needle Bearings are used to assure smooth, friction-free speed of operation . . . reduce power and maintenance requirements . . . provide *the anti-friction efficiency that helps machines do more work at less cost in time, effort—and money.*

In the highly competitive markets ahead, the profits will go to those who build, sell or operate equipment with such advantages as Torrington Needle Bearings offer. You should know the full story of those advantages in terms of *your* product. Our new Catalog 32 illustrates and explains them in full. May we mail you your copy today?

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TORRINGTON NEEDLE BEARINGS

REVOLVATOR

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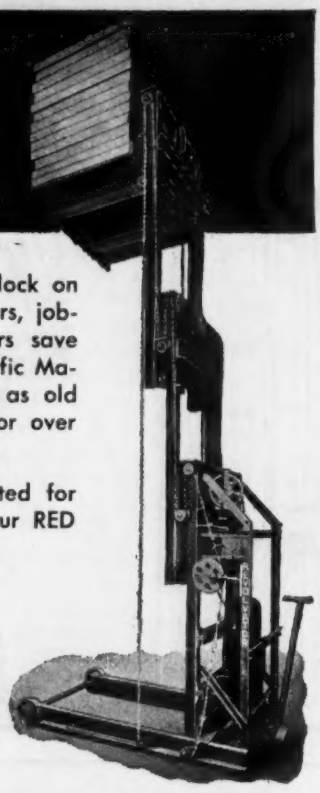
MATERIAL HANDLING EQUIPMENT



Time and labor were cheap when they piled block on block to build the Pyramids. Today, manufacturers, jobbers, warehousemen, printers, and many others save time and labor by installing REVOLVATOR scientific Material Handling Equipment. No REVOLVATOR is as old as the Pyramids, but many have been in use for over 30 years and are still giving satisfactory service.

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for main motions. Capacity of the Bucyrus-Erie dragline which it will operate is illustrated by the fact that the excavator can dig 140 ft deep and can dump about 360 ft from where it digs. It will have a 25-yd drag bucket on an 180-ft boom, and combined weight of bucket and full load is 130,000 lb.

The 2,410,000-lb machine will be able to step off 7½ ft at a stride, zigzag between working locations, sidestep at any angle, and travel over soft and irregular ground. Direction may be changed by swinging the machine's revolving frame. While dragline is in digging operation, walking shoes will be carried high on the mammoth frame.

Two-Stage Chemical Method Reclaims Torch Burner Tips

A two-stage chemical method for reclaiming burner tips and welding torch fittings without manual labor has been developed by Turco Products Inc., 6135 South Central avenue, Los Angeles. Burner tips and fittings are soaked in Turco L-780, a liquid material with solvent and penetrating actions, which digests carbon and gum deposits, softening and loosening them so that they may be freely rinsed away. Material is noncorrosive to copper and brass, is noninflammable, and mixes readily with water. It is used at room temperature in an ordinary steel tank or container. Overnight soaking is said to be sufficient to loosen and soften carbon and dirt. After soaking, parts are rinsed clean in a vigorous air and water spray.

Although physically clean, parts often oxidized and tarnished due to the high heat to which equipment is exposed. A dip in Turco Brass Dip, a safe, detarnishing liquid, removes film, leaving metal clean and bright. Dip is made in a ceramic crock or container. A small amount of material will clean several hundred burner tips and fittings. Turco Brass Dip also passivates the surface, making it corrosion resistant between cleaning periods. Literature describing this process in detail is available from the company.

Use of Soaps in Ore Concentration Described

U. S. Patent 2,364,778, granted to E. H. Brown and F. X. Tartaron, illustrates the value of soaps in froth-flotation methods for concentrating ores. It describes methods of concentrating finely divided oxidized iron ores in which the gangue ingredient is principally quartz. This consists of treating an aqueous pulp of such an ore with an anionic collecting agent. Included in suitable agents for this purpose are soaps high in fatty acids or resin acids. Co-operating agents, like lime and acid-treated starch solutions, also are used. Ore pulp thus treated is subjected to froth-flotation and the silica-containing froth is re-

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Electric welded in sizes 3/16 to 5/8". Heavier sizes fire welded. Natural finish . . . For greater strength we recommend Super Steel Chain and Sterling Dredge Iron Chain for Sling Chains.

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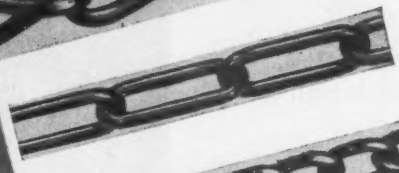
Twist Link. Electric welded. Bright finish. 9 sizes . . . Packed 100 feet in a carton.



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Straight Link. Electric welded . . . Bright finish. 9 sizes, No. 6 to 7/0. Packed 100 feet in a carton.

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Twist or Straight Link . . . Twist link supplied unless otherwise specified. Electric welded. Bright finish. 9 sizes.

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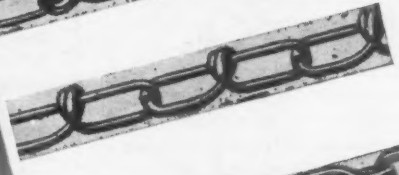
A flat, flexible, strong wire chain. Range of 9 sizes . . . Ideal for conveyors, rolling doors in use over sprockets. Finishes: Bright, Bright Galvanized and Hot Galvanized.



BUCKEYE PATTERN CHAIN
Also known as Brown Pattern. The most popular type weldless steel wire chain . . . Made in 10 sizes. Finishes: Bright, Electro Galvanized, Hot Galvanized or any plate.

SAFETY CHAIN
Made of Steel or Brass. 3 standard sizes, .018 to.028 gauge. Finishes: Bright, Bright Galv. and Coppered.

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Plain
Standard drop-forged cold shuts commonly used for chain repairs, also for attaching hooks, rings, etc. Order one size larger than chain. Natural finish.

SLIP & GRAB HOOKS
Drop-forged from steel, regularly supplied self-colored, also available in polished finish when desired.

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For joining chain temporarily. May be closed cold or welded. Regularly furnished bright. Packed in cartons.

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Adjustable for lifting barrels in either vertical or horizontal position.

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End Ring is used at top for lifting barrels in vertical position.

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moved, producing in the pulp residue a concentrate rich in oxidized iron.

Electric Current Control Protects Arc Welders

A safety control for arc welders, invented by electrical engineers of Michigan City, Ind. plant of Pullman-Standard Car Mfg. Co., automatically reduces open circuit voltage of the electrode, which creates welding arc, from 110 to 24 v when welding contact is broken. Open circuit voltage of welding equipment is isolated from electrode holder as soon as operator breaks the arc or welding spark. A control voltage of 24 v is automatically impressed on electrode cable when electrode again contacts work so that the welding transformer is connected to the electrode, and welding proceeds.

Contour Developer Facilitates Model Making

Making plastic models or molds of contour parts is facilitated by mechanical equipment developed on the West Coast and is used for replacing methods requiring a high degree of skill, according to Production Information, published by Automotive Council for War Production, War Products Division, New Center Building, Detroit 2. Equipment is known as the Contour Developer, a precision tool which helps to translate data from layouts or lofts into a physical representation of part contours. It also is used in developing mockups. Work can be done directly from drawing or layout without wood models or templates and without making accurate measurements, as all dimensions or contours are scaled directly from drawing. This method offers a saving in time compared to former methods.

Principal piece of equipment involved consists of a base surface plate with a large cut-out and with edges accurately scaled to permit proper positioning of frames containing a series of adjustable contour points. Layout or photographic reproduction of metal loft is located on a set-up table, and drawing is referenced to a base line by two angle surface plates. On top of the drawing the frame assembly containing contour points is clamped into position against angle surface plates. Contour points are set to the contour line by the operator with a movable angle surface plate. A feature of equipment is that movable angle can have attached to its face a strip of metal the exact thickness of the sheet used for the finished product, so resulting plaster model for a die will be compensated for metal thickness.

As each contour line is developed, the frame representing that line is placed on the base surface plate in correct position and locked into place. Spacing of frames and of contour points normally is at 2½ in., corresponding to the usually used increments, the 10-in. lines

Here's one of the GREATEST TOOLS EVER PRODUCED

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SAWS and FILES in Hard-to-get-at Places

The Saw-Gun, illustrated above, will definitely speed up sawing and filing operations in your plant. Attach it to an electric drill, or propel it with compressed air or flexible shaft. Insert a hack saw blade in the holder and cut into metals of every description with astounding speed. Works equally well on plastics, wood and other materials. Ideal for panel notching and slotting operations. It's portable . . . carry it from job to job. For filing operations insert a file in special holder.

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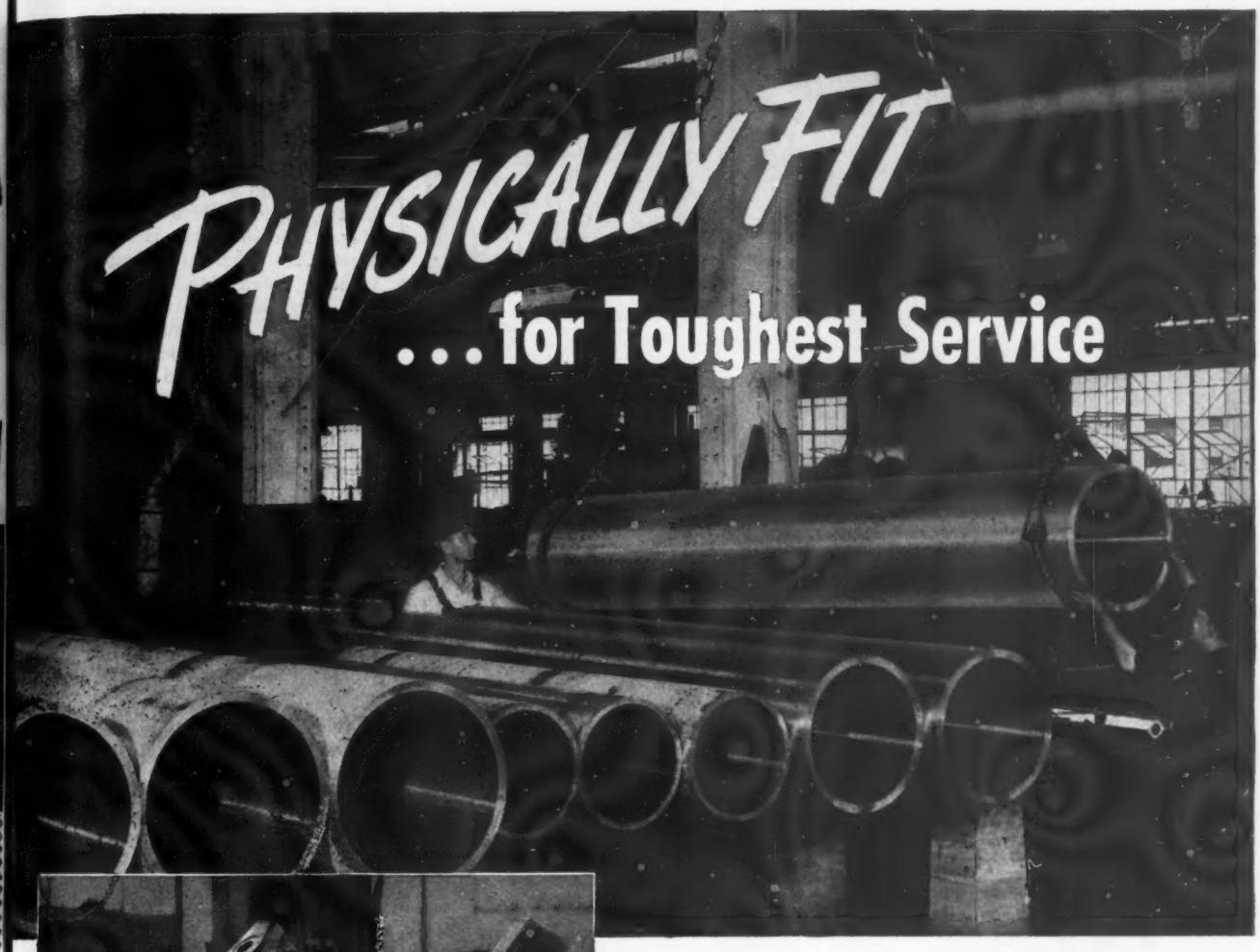

This large centrifugally cast cylinder, is being precision finished in the Shenango-Penn machine shop which is equipped with a wide range of modern machine tools for the fine finishing of castings, large and small. Above—Large sleeves ready for shipment.

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"CAST centrifugally by Shenango-Penn" has plenty of meaning to users of rolls, roll covers, bushings, bearings, sleeves, liners and other tubular parts. It means castings with higher tensile strength, greater density, uniform grain structure and a welcome freedom from porosity, blowholes, sand inclusions and other structural defects. It means machinery and equipment parts that will outwear and outperform ordinary castings of the same analysis by a wide margin . . . and at a lower cost per part.

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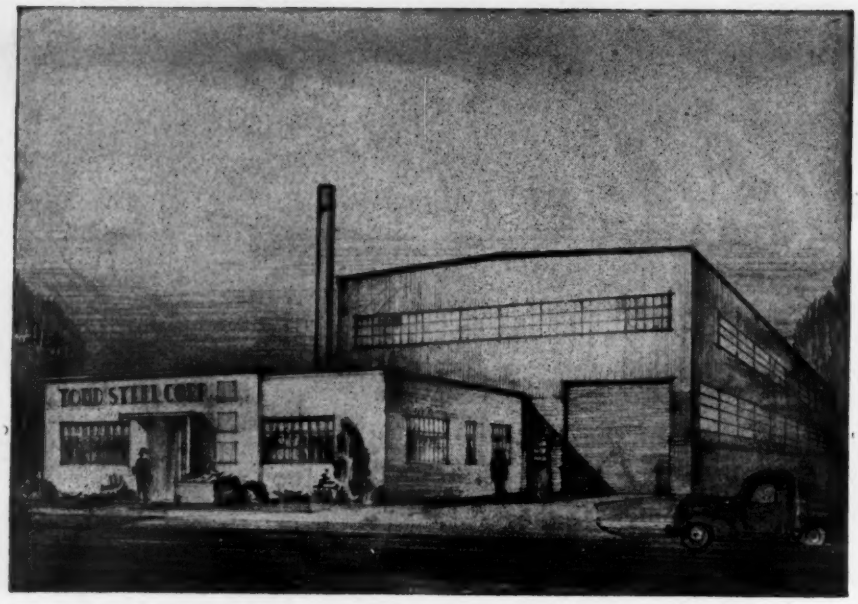

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used on layouts and loft boards. Close spacing, down to approximately ½-in. can be obtained by auxiliary points between the main contour points.

When frame and contour points are in position, large washers are dropped over the contour points and a metal lath or screen laid over them. Screen serves as a foundation for a layer of modeling clay. Modeling clay is roughly faired leaving the spherical contour points protruding about 1/32-in. through clay. The only skill or care required at this stage is to make sure that modeling clay is faired properly between the points so that desired contours can be established at the next stage in the plaster.

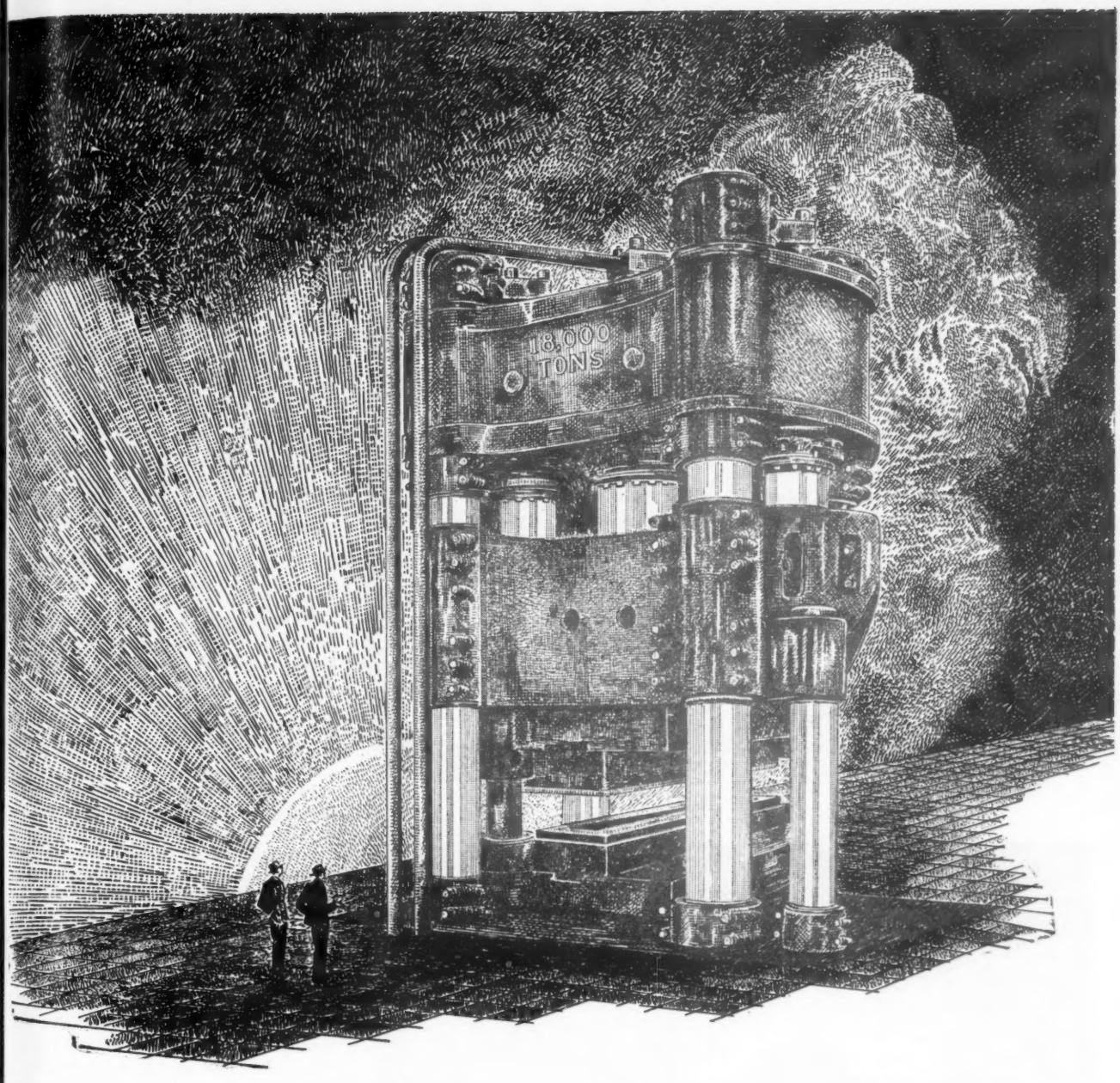
Plaster or Hydrocal then is poured into clay mold and, after it has shrunk, a base is attached to plaster cast. Before removing cast from mold, center lines are scribed in the plaster and accuracy of the base itself can be checked and controlled. Cast is removed from the mold and put on the fairing table. Indented impressions caused by protruding points are daubed with a contrasting color to guide in fairing operations. Plaster is faired by using spoke shaves or thin metal splines until only very small dots of paint remain, showing where tips or contour points came in contact with plaster. Splines and thick crayon are used in a manner similar to the bluing and scraping operation used in finishing other surfaces. Plaster scrapes off readily, leaving a hard, smooth precision surface.

Precision Tools Machine Valves Rapidly

Precision machine tools for machining aircraft valves rapidly and economically, maintaining close limits and fine quality, are manufactured by Ex-Cell-O Corp., Detroit 6. Vol. 20, No. 1, of *Tool Tips*, the company's house organ, contains illustrations of various operations performed by these machine tools on valves, including: Turning the cup-shaped profile on top of heads of aircraft intake valves; precision turning the locating boss on top of the head on hollow-head aircraft valves prior to closing in stem holes; turning the dome-shaped profile on top of aircraft exhaust valve heads—hollow-head type; form grinding on a hollow-head sodium filled aircraft engine exhaust valve; and grinding valve spring retainer grooves out of solid stem.

Large Brass Forgings

Brass forgings, said to be the largest ever produced, are being manufactured by Titan Metal Mfg. Co., Bellefonte, Pa. Huge presses, transported to Bellefonte on specially built railroad cars and capable of exerting a 2500-ton pressure, can forge hot pressed brass parts weighing as much as 100 lb each. Among features of the brass forgings are: Improved physical properties, good surface conditions, close tolerances, and freedom from porosity.



Looming on the horizon—the largest die forging press in the world, now in process of installation at Wyman-Gordon. When this press is completed at the end of this year, magnesium and high strength aluminum alloy forgings larger than any yet made will be available. This press will be operated by Wyman-Gordon Products Corporation, a wholly owned subsidiary of Wyman-Gordon Company for the account of Reconstruction Finance Corporation which owns the press, and will be available to aircraft manufacturers in particular and to industry generally for experimentation in and for the development and production of light metal forgings. This means to our aircraft industry reduced weight which, in turn, means increased pay-load and greater performance for American planes . . . And for industry in general—complete range of magnesium and aluminum forgings.

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WORCESTER, MASSACHUSETTS, U. S. A.

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Coolant—Super-Cut coolant for diamond wheels clings to diamond surface and forms a film, preventing hot chips from being imbedded between diamond teeth. Thus wheels can clean without loading or glazing and can cut free and cool. It can be applied by pump, wick or drip feed in sufficient quantity to keep diamond surface wet. Industrial Abrasives Inc., 3724 West 38th street, Chicago 32. ST402

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Explosion-Proof Motor—Totally enclosed fan cooled unit meets Underwriter's Laboratories specifications for Class 1, Group C installations—where surrounding atmosphere is charged with ethyl ether vapor. Century Electric Co., St. Louis 3. ST 337

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Broaches—Solid tungsten carbide broaches, available in diameters 0.250 to 1 in., moderate lengths. Willeys Carbide Tool Co., 1340 West Vernor Highway, Detroit 1. ST 330

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Lubricant—Lap-Lube causes active particles to react on lapping grains and powder to speed action and impart a lustrous finish to metals. For use as a carrier for all lapping agents and for honing and polishing. Aids in grinding operations. Protective Coatings Inc., Box 56, Detroit 27. ST 353

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Heat Measurement — "Stick" compounded of material which melts at predetermined heat indicates temperature in welding, heat treating, and other fabricating operations. Especially suited for overhead, vertical or inclined surfaces. Tempil Corp., 132 West 22nd street, New York 11. ST 333

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Rust-Inhibiting Oil—Witch Oil protects metal stampings after pressing and while in storage or transit and acts as a bond for paint or enamel. Withstands baking heat up to 250° F and also maintains a film on interior of shell. May be used for all types of steel stampings, forgings and castings. Mitchell-Bradford Laboratories, Bridgeport, Conn. ST 383.

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Boring Bars—Available with separate cutters in sets of four: $\frac{7}{16}$ x 5, $\frac{1}{4}$ x 6, $\frac{9}{16}$ x 7, $\frac{1}{2}$ x 8 in. For use without bushings or adapters, require no special clamps or holders, grip tool bit so that boring or threading to bottom of hole is possible

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The key to Mass Precision is simplicity—simplicity of design in every part and in the complete assembly; simplicity of design in tools, jigs and fixtures; simplicity of methods for every step in production; simplicity of gaging.

Simplicity is not easy to achieve. Many manufacturers, for the past 40 years, have depended on Nichols to build assemblies that require precision tolerances. Equipment, methods and experience are the factors that qualify Nichols to produce such assemblies in volume at prices that meet competition.

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This big, convenient marking crayon can be used as easily as a pencil, yet has all the qualities of paint.

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without interference from setscrews or bolts. Robert H. Clark Co., 9330 Santa Monica boulevard, Beverly Hills, Calif. ST 335

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Acid-Proof Apron—Of treated fabric impregnated with plastic, 35 x 47 in., weighs 1¾ lb, criss-cross shoulder straps, can be washed or dry-cleaned. B. F. Goodrich Co., Akron, O. ST 336

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Relay—A keying relay of simplified and rigid construction and utilizing a minimum of parts is said to hold adjustments. It is lightweight and all parts are readily accessible for inspection or adjustment. Struthers-Dunn Inc., 1321 Arch street, Philadelphia 7. ST 340

—o—

Dry Drawing and Annealing Compound—For deep drawing brass and steel, compound, No. 268, is applied as a waxy, aqueous emulsion in either a drum or spray type mechanical washing machine at an operating temperature of 175 to 185° F. Plasteel Corp., 3900 West Jefferson, Ecorse 18, Mich. ST 342

—o—

Oil Concentrate—Gibraltar diesel fuel oil concentrate prevents corroding and sticking of injector nozzles and gives cylinder lubrication where ordinary oil fails. It mixes without agitation with any regular type fuel oil. Hood Refining Co., 253 North Hamilton avenue, Greensburg, Pa. ST398

—o—

Skin Protector—Sealskin, a compound which forms a durable, invisible waterproof coating over the skin, acts as a preventive against infection, and most dyes, stains, and grime may be washed off with soap and water without removing coating. Dept ST2, Cadet Laboratories, Worcester 5, Mass. ST 386

—o—

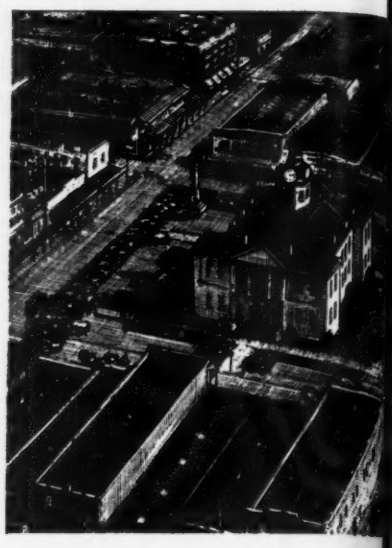
Fire Resistant Chemical — Fi-Retard liquid reduces danger of fire in foundry molds by making wood fire-resistant. It is applied by dipping molds in liquid. Chemical solution is absorbed into the wood and does not change mold dimensions. General Detroit Corp., 2270 East Jefferson avenue, Detroit 7. ST 385

—o—

Noncorrosive Flux — Zenith Super Flux for soldering electrical connections also is recommended for soldering copper, cadmium plated brass and steel, black steel, and to facilitate tinning of soldering tips. It is applied by brush or dipping. Polan Industries, Huntington 19, W. Va. ST400

—o—

Safety Goggle—Aids workers in keeping eyes focused on job. Features an eye-cup providing maximum eye protection, increased ventilation and greater comfort. Cups are shaped separately to fit contour of right and left eyes. American Optical Co., Southbridge, Mass. ST 338



TROY, ALABAMA
Now Has a Layne Automatic Water Syste

City Officials of Troy, Alabama are in hig spirits these days. Where all others hav failed, Layne has just completed a wate system WITHIN THE CITY LIMITS tha produces over 1,000,000 gallons daily. Fur thermore this new system is equipped wit the latest automatic control device whic eliminates manual starting and stopping.

Prior to the completion of this New Layn System, all water for the city of Troy wa obtained from wells located some three miles away. The success achieved by Layne will now enable the city to install other wells and thus abandon the distantly lo cated and expensive to operate system.

Here again is proof that Layne's experience, knowledge and specialization alway pays handsome dividends. Building this wel was no easy task. It was drilled through rock strata from one to sixteen feet in thickness. Some five-hundred bags of cement were used to seal off all but the desired water bearing sand formations.

Layne is now almost entirely engaged in civilian Well Water System building—and is ready to serve you. Write, wire or phone for further facts, catalogs, bulletins etc. LAYNE & BOWLER, INC., General Offices Memphis 8, Tenn.

LAYNE PUMPS —fulfill every need for producing large quantities of water at low cost from wells, streams, mines or reservoirs. Send for literature.

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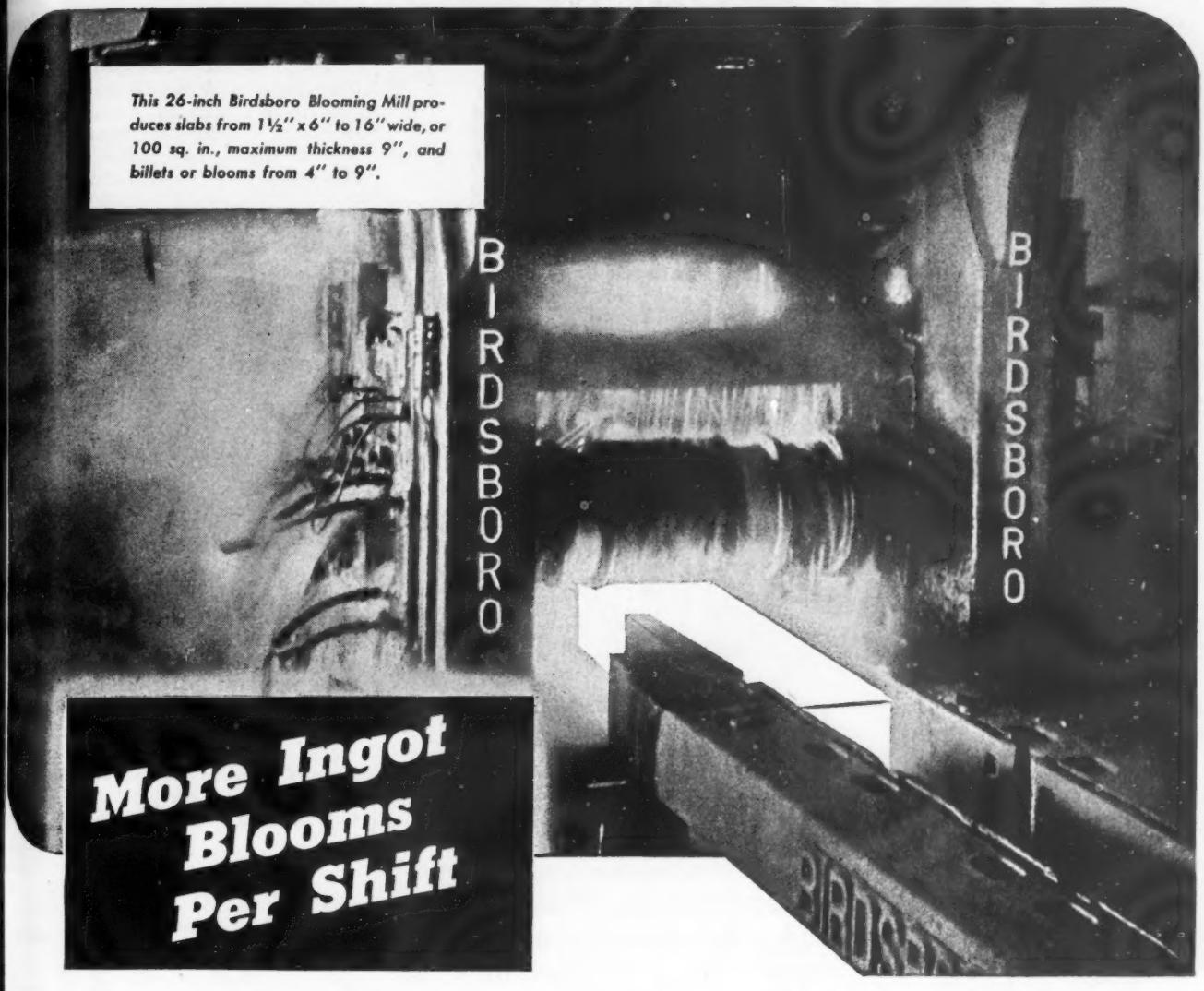
LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS



This 26-inch Birdsboro Blooming Mill produces slabs from 1½" x 6" to 16" wide, or 100 sq. in., maximum thickness 9", and billets or blooms from 4" to 9".

More Ingot Blooms Per Shift

with Birdsboro Rapid Two-High Reversing Blooming Mill . . .

for blooming ingots of mild, tool, non-corrosive, automotive, aircraft and special purpose steel

to square, round and rectangular blooms and slabs

with the proper reductions required by the various grades of metals

within time limits the rolling temperatures permit.

Special features of this Birdsboro Rolling Mill—quick reversing, fast screw-down and rapid manipulation—provide the exceptional speed that is demanded by war-pressed production. Yet their low installation cost, low maintenance cost and low power consumption assure the economy that will be needed after Victory is achieved.

If yours is a rolling problem—of either the present or future—it will pay you to consult Birdsboro.

BIRDSBORO STEEL FOUNDRY AND MACHINE COMPANY, Birdsboro, Pa.

BIRDSBORO
STEEL MILL EQUIPMENT

TITAN

HOT PRESSED BRASS FORGINGS

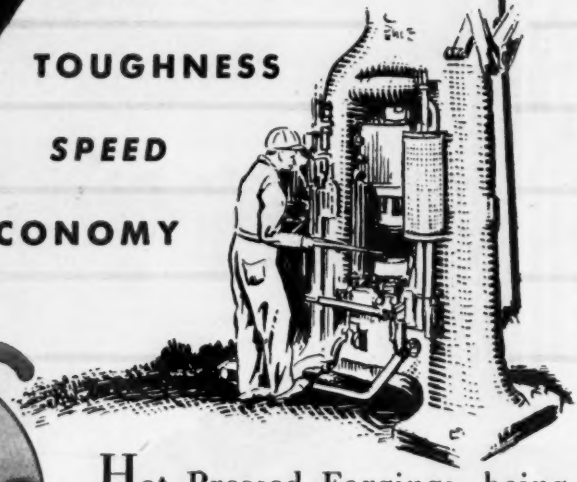
FOR

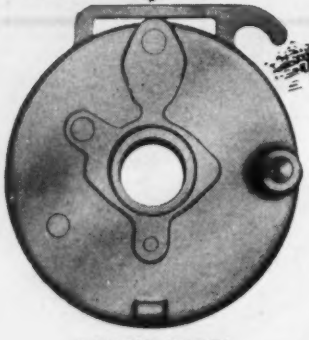
STRUCTURE

TOUGHNESS

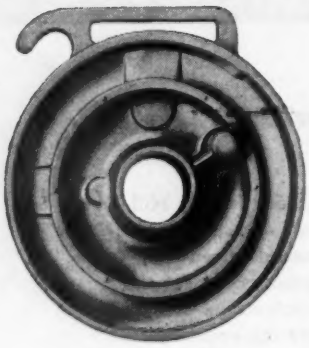
SPEED

ECONOMY





FRONT VIEW



REAR VIEW

Hot Pressed Forgings, being twice worked, are hard and tough, free from blow holes, sand inclusions, porosity and other defects which commonly characterize sand castings. Tolerances are under dependable control. Tolerances are practicable to + or − .006 inch. Finishing time and costs are low. Final appearance is excellent.

Users of parts produced by other methods may well consider these advantages in conjunction with their anticipated peace-time requirement of parts ranging up to 100 pounds per unit, and NOW is the time to take the matter under advisement. Write for literature on the subject.

Titan

METAL MANUFACTURING CO., BELLEFONTE, PA.

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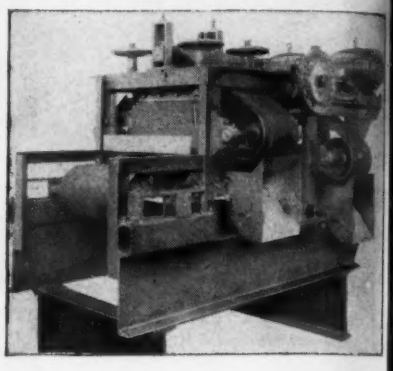
Quality Alloys By Brass Specialists

Brass and Bronze Rod • Forgings • Die Castings • Welding Rods

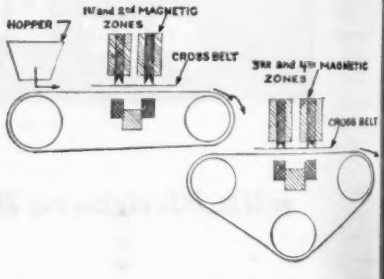
Separator Removes Iron Fuzz, Reclaims Abrasives

A high intensity dual cross belt electromagnetic separator for removing iron fuzz from nonferrous borings and for reclaiming abrasives from grinding wheels, shown here, affords complete separation of nonferrous borings, insuring



production of high grade iron-free ingot from scrap and protects extrusion dies, cutting tools, etc., from slivers of iron.

Diagram, below, shows how material to be separated is loaded into a hopper, from which it is distributed uniformly onto the first main belt by a reciprocating feeder. When material passes through the first and second magnetic zones, magnetic particles are lifted by the upper magnets and pushed up by the

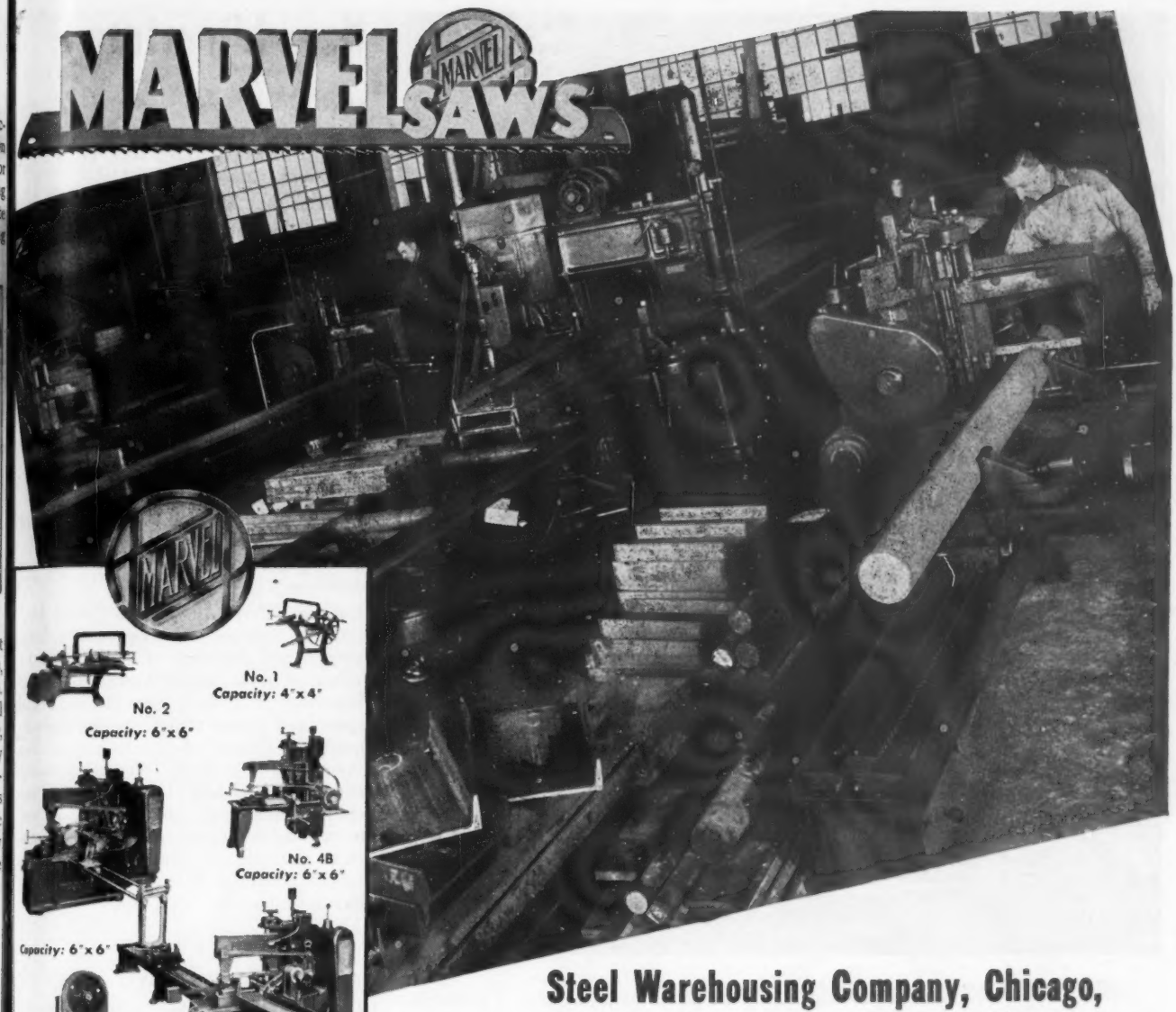


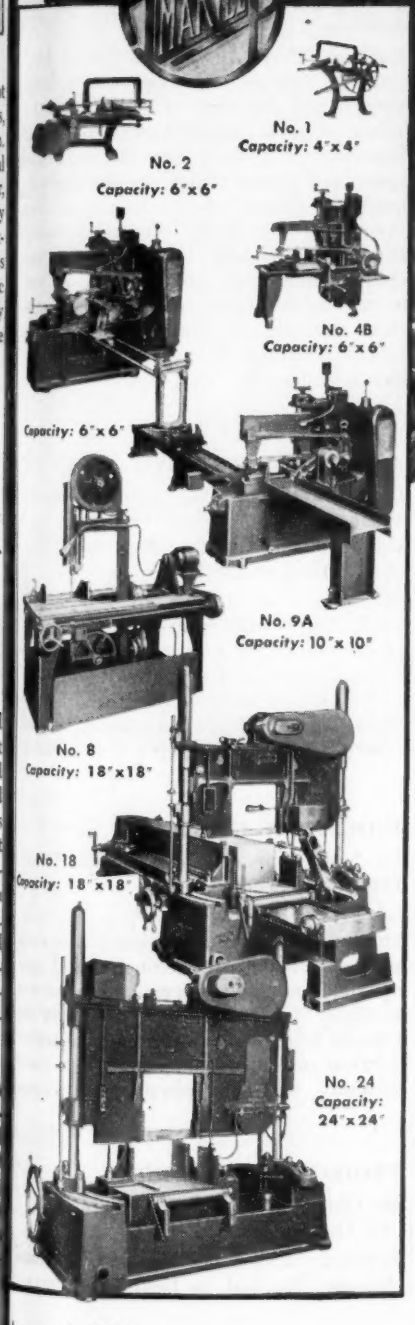
lower ones. In this way they are held fast to the under surface of the first cross belt, which carries them beyond the magnetic influence to be discharged at the side. First main belt discharges onto the second main belt, at which point material is turned over. It then is subjected to another magnetic treatment in the third and fourth magnetic zones. Resulting separation is said to be for all practical purposes 100 per cent effective, according to Dings Magnetic Separator Co., 509 East Smith street, Milwaukee 7.

—o—

A 44-page catalog, No. L-45-A, on diesel-electric locomotives, giving specifications on both narrow and standard gage locomotives ranging from 30 to 100 tons, is available from H. K. Porter Co. Inc., Pittsburgh 22. It also contains engineering and construction data, as well as necessary information for selecting the proper type of locomotive.

MARVEL SAWS





Steel Warehousing Company, Chicago, Features Prompt Delivery

Pieces or lengths cut from bars, tubes or structural shapes can be delivered promptly by this steel warehouse, because they have the MARVEL Saws to handle any cut-off job. Three No. 9A MARVEL Automatic Bar Feed Saws (capacity 10" x 10") which automatically feed, measure and cut-off identical lengths or slices (as gear blanks) from single or nested bars at terrific speed. The fastest hack saws built—these automatic saws require no more operator attention than an automatic screw machine. They are extremely accurate, too, and can be stopped any time in a quantity run, a miscellaneous cut made, and automatic operation resumed by simply re-engaging the bar push-up.

Structural shapes up to 18" and large bars of equal diameters are saw-cut on the No. 18 MARVEL universal Roll Stroke Hack Saws. Cuts are accurately "square" and clean with practically no burrs. This modern saw which is completely armoured to stand the rough handling unavoidable where large work is done, introduces the new roll-stroke principle which enables it to cut-off the toughest steel in the largest sizes rapidly and with extremely long blade life.

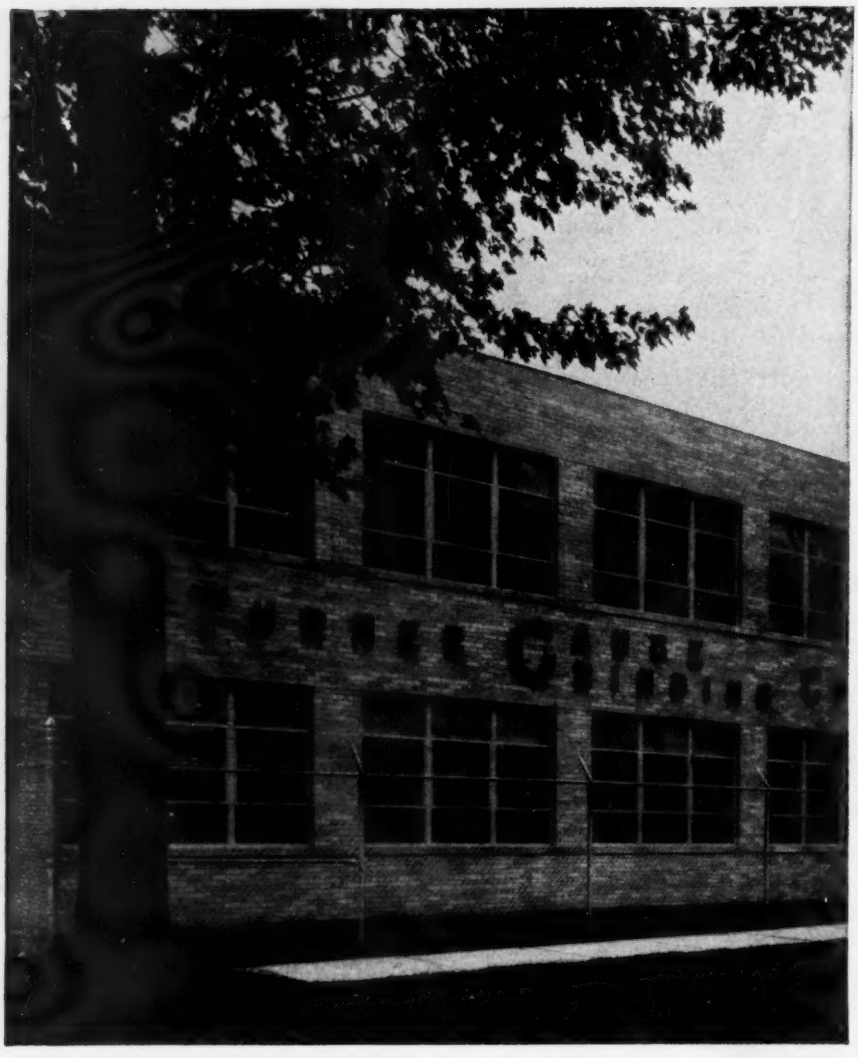
For quick reference see our section in Sweet's File - Mechanical Industries, or write for catalog.

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 BLOOMINGDALE AVENUE CHICAGO 39, U. S. A.

Eastern Sales Office: 225 Lafayette St., New York 12, New York



FIVE BROTHERS founded the Turner Gauge Grinding Company at Ferndale, Michigan, and proceeded to develop an organization of skilled workers backed by the best precision equipment obtainable. Buildings are modern, well ventilated and clean. Superior working conditions generate a superior product. Made here are Cylindrical Plug Gauges, Plast-O-Lock Plug Gauges, Cylindrical Ring Gauges, Special Flush Pin Gauges, Solid Type Snap Gauges, Master Discs and Built-up Gauges.

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The men who make TURNER *gauges*

We believe that the development of the individual and the expansion of our company are *mutually dependent realities*. That is why the men at Turner experience individual freedom and initiative, which in itself, seems to encourage a real desire for cooperation among all employees.

New Literature

SPECTROMETER

By North American Philips Co. Inc., 100 East 42nd street, New York 17.
(An 8-page illustrated booklet.)

Contains a description of the spectrometer for industrial research by H. Friedman of the Naval Research Laboratory. It gives details of the theory underlying X-ray powder diffraction, how the Norelco Spectrometer works, its performance and applications, with illustrations, diagrams and curves. Booklet also covers tubes, circuits and losses and explains "flip-flop" counting action.

—o—

TRANSMISSIONS

By Drive-All Mfg. Co., 3400 Connor avenue, Detroit 14.
(A 40-page catalog, with illustrations and drawings.)

Entitled "Drive-All 'Drives Them All'," catalog contains descriptions, photographs, and drawings of applications for industrial transmissions. Transmissions and brackets are built to provide individual speed and power control to machines requiring a change of speeds, are used on conveyors, agitators, blowers, mixing machines, food and other processing machines, laundry equipment, etc., as well as on machine tools, and control each machine individually. Shifting lever selects speeds needed for various types of machines and work.

—o—

AUTOMATIC GLUE POT

By Kindt-Collins Co., 12651 Elmwood avenue, Cleveland 11.
(A 2-color leaflet, No. B-4, with illustrations and graphs.)

Contains a description of the Master automatic electric glue-pot, 2-qt capacity, including specifications. Among advantages claimed for it are: It maintains uniformly low temperature; requires no replacement of fluid; there are no manual controls; and use of inserts is eliminated.

—o—

INDUSTRIAL SERVICE

By Sam Tour & Co. Inc., 44 Trinity Place, New York 6.
(A 2-color illustrated folder.)

Outlines service and facilities of the company's metallurgists, engineers and consultants, and shows views of laboratories available for research. It also lists the type of assignments undertaken in metallurgical and chemical engineering, metal finishing, corrosion, physical metallurgy.

—o—

PROJECTION WELDING

By Ohio Nut & Bolt Co., Berea, O.
An 11-page folder.)

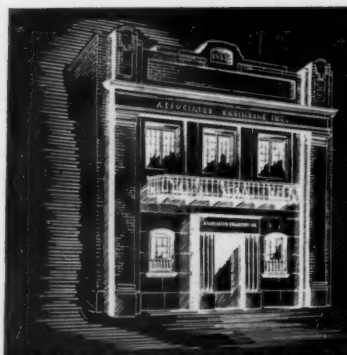
Entitled "Projection Welding," manual discusses its part in field of resistance

Preformed wire rope

SAVES REPLACEMENT 3 WAYS

Since preformed wire rope lasts longer, obviously it reduces frequency of replacing the rope itself. Not quite so obvious, but equally important, is the ease with which preformed wire rope adjusts itself to different uses. Because of its ready adaptability—its resistance to rotating in sheave grooves and its better spooling qualities—preformed postpones the replacement of machine parts or shut-downs for repairing. A third way in which preformed wire rope saves replacement is with the men on the job. As preformed rope is safer to handle it reduces lost-time accidents. Make certain your next wire rope is preformed.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR



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Illustrated folder on request

- Industrial Engineering
- Methods
- Plant Layout
- Production Flow
- Work Standards and Costs
- Job Evaluation
- Wage Incentives
- Architecture
- Structural Engineering
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welding and its applications in connection with headed and threaded products. Manual also offers information regarding djustments with respect to heat, pressure and time necessary in obtaining the perfect weld; how and why development and use of electronically controlled machines have facilitated making adjustments; and economies effected and bonding and fastening results obtained in assembly and subassembly part of industrial production. Progress has been aided y development of special weld bolts, nuts and other products.

—o—

ELECTRONIC EQUIPMENT

By Walker-Jimieson, radio and electronic distributors, 309 South Western avenue, Chicago.
(A 36-page, 2-color catalog, illustrated.)

Contains data on advanced types of electronic instruments, devices and tools, and descriptions of products such as industrial X-ray machines, electronic comparator, test equipment including signal generators, tube testers, and multitesters, photoelectric devices, die-less duplicating tools, plastic sectional wiring systems, etc.

—o—

PROPELLER PUMP

By Fairbanks, Morse & Co., Pomona Pump Division, Pomona, Calif.
(A 6-page, 2-color bulletin, AQB500.1, illustrated.)

Illustrates construction of the Niagara propeller pump, with low lift and large capacity, gives specifications and lists several applications.

—o—

INSULATING BRICK

By Harbison-Walker Refractories Co., Farmers Bank building, Pittsburgh 22. (Folder.)

Entitled "Five Insulating Brick of Prime Importance to Refractories Users," folder contains information on development of insulating fire brick to achieve proper balance between the interrelated properties of strength and thermal efficiency. Attainment of light weight without sacrifice of mechanical strength necessary to insure minimum loss through breakage is explained.

—o—

HOME WIRING

By Industrial Relations Dept., Westinghouse Electric Corp., 306 Fourth avenue, Pittsburgh 30.
(A 120-page handbook, B-3510, with diagrams and illustrations, $1 each.)

A home wiring handbook for simplifying planning of modern wiring systems for homes within the popular price range. Homes are divided into four groups of varying gradations in electrification. Complete details are covered for each group, including recommended electrical equipment (fixed and portable), outlets needed for each room, circuits required, control centers, feeders and service entrance, type of circuit protection, signal systems, tele-

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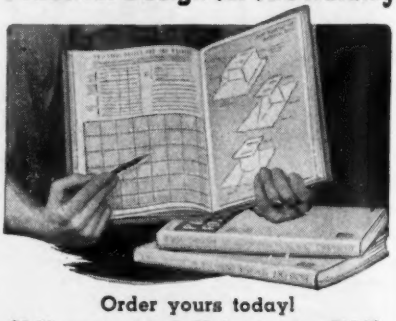

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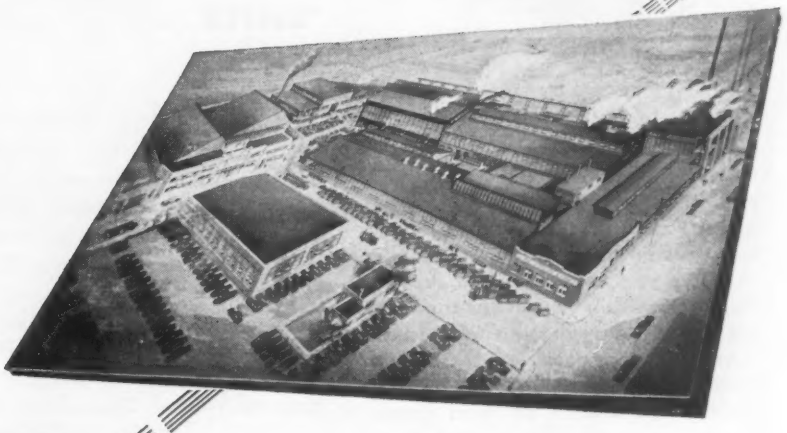
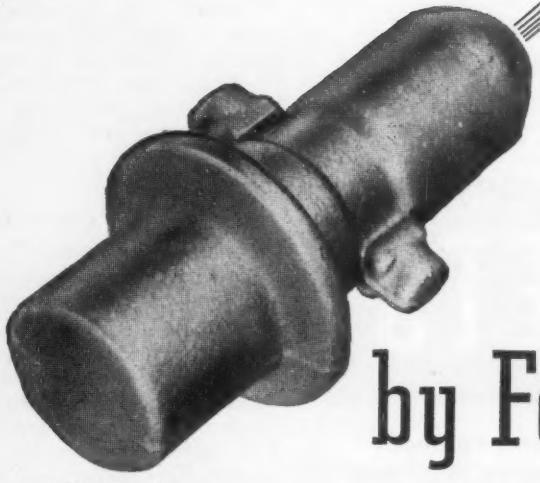
One purpose . . .

the IMPROVEMENT of Metals



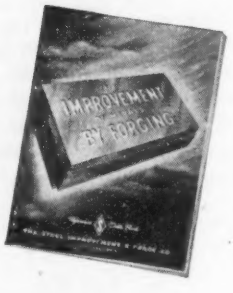
Here the most modern forging and heat treating equipment is being utilized, under the direction of highly skilled executives and technicians, to obtain volume production of forgings for the war effort, and to make available for the peace to come high quality forgings for every industrial use.



Collet Forging

by Forging

Unusual wartime production required the development of forging techniques and procedures by which numerous so-called "impossible-to-forge" designs were successfully forged. These notable advancements in forging techniques are now available to make forgings practical for many more applications in all types of equipment. In forgings you can obtain strength and toughness in the exact degree required to meet a specific service condition. The IMPROVEMENT OF METALS BY FORGING develops maximum metal quality. Consult a Steel Improvement Forging Engineer about how to utilize fully the fibre-like flow line structure of wrought metals to assure dependable performance for a part or a product. Backed by over 31 years of forging production experience, a Steel Improvement Forging Engineer can guide you to a successful application of forgings and possible reductions in the cost of machining and processing.



Reference Data Booklet presents many new ideas on forgings and their applications in many different types of equipment. Copies available to engineers, metallurgists and executives.

DROP FORGINGS

THE STEEL IMPROVEMENT & FORGE CO.

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SMOOTH ACTION FOR AIR OPERATED UNITS . . .

Correct working pressure means smoother, better operation of pneumatic equipment, and often the correct pressure is considerably less than full line pressure. Hannifin Pressure Regulating Valves provide the accurate sensitive reduction of air pressures that helps operators get the most from pneumatic machinery. Hannifin piston-type design provides instant adjustment over the entire pressure range from 150 lbs. down. Long valve stem travel in this design gives large volumetric capacity to meet fluctuating demand with minimum restriction to flow. Write for Regulator Bulletin 56 with full description. Hannifin Manufacturing Company, 625-631 So. Kolmar Avenue, Chicago 24, Illinois.

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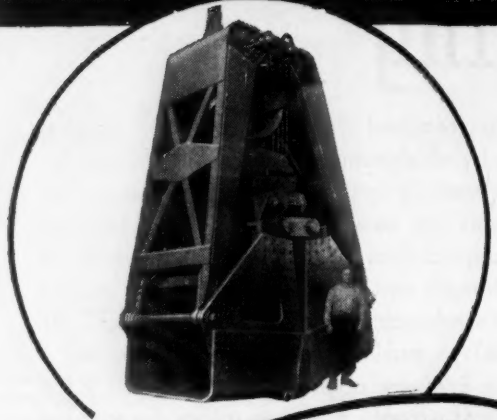

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phone and radio. Book will be kept up-to-date with revision sheets mailed to purchasers in the event that changes in the National Electric Code affect it.

—o—

BRONZE ALLOYS

By Ampco Metal Inc., Milwaukee 4. (Illustrated bulletin, No. 59.)

Contains photomicrographs, data on physical properties and chemical compositions of the Ampcoloy series of bronze alloys with controlled analyses. Ampcoloy alloys include aluminum bronze, high lead bronze, tin bronze, manganese bronze, beryllium copper, and high conductivity alloys. Series is produced to quality standards, with many meeting government specifications.

—o—

HOB CONTOUR CHECKER

By Michigan Tool Co., 7171 East McNichols road, Detroit 12. (Bulletin No. 464-45.)

Describes Model 464 Sine-Line bench type checker for contours of hobs ranging up to 6 in. OD with a maximum length of 8½ in. Checker is said to assure that all hobs for the same job will produce gears of identical characteristics by locating errors in hobs, checking contour of hob teeth to 1/10,000-in. A sine-bar is used to eliminate the necessity of having a number of interchangeable angle blocks for different pressure angles.

—o—

MERCURY ARC CONVERTERS

By Allis-Chalmers Mfg. Co., Milwaukee. (An 8-page, 3-color bulletin, No. 6373, with illustrations and graphs.)

Offers information on standard mercury arc converters for use in induction heating operations in the 500-2000-cycle frequency range. A drawing and wiring diagram of a typical installation shows how the company supplies essential apparatus for complete induction heating installations, including coils, furnaces, and cubicles. Excitron converter has a conversion efficiency of 90 per cent or better as frequency changer equipment, and units are built to supply power for induction heating in blocks of 250, 500, and 1000 kw and higher. Graphs and photographs compare unit to other equipment used for induction heating, with differences between old and new methods of heating and melting metals summarized.

—o—

CHAIN BELT

By Chain Belt Co., Milwaukee 4. (A 4-page, 2-color folder, No. 461, illustrated.)

Illustrates and describes new flat-top conveyor chain and gives construction details. Rex table top chain belt has wide application in food handling and bottling or capping processes, and also is said to be useful to manufacturers of small parts.

FORGED FLAT SPRINGS
. . . . MADE IN ANY DESIGN FOR HEAVY DUTY APPLICATION

Muehlhausen's ability to produce forged flat springs in large quantities, and to any special design, has given product engineers greater latitude in developing improved war matériel—and provided greater speed in producing it.

This is the result of Muehlhausen's complete hot forming facilities — huge presses, controlled-atmosphere furnaces, quenching tanks as big as swimming pools, a control laboratory for testing and checking—all housed in a separate, complete plant, specially designed for volume production of heavy springs.

Don't let the improvement of your product be hampered by spring problems. Consult Muehlhausen engineers and get the benefit of their experience. Muehlhausen's ability to produce unusual springs may help you do things never before thought possible. *Send for Free Die Spring Bulletin.*

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MS SPRINGS
EVERY TYPE AND SIZE

Book Notes

Great Lakes Red Book For 1945 Is Ready

Great Lakes Red Book; paper, 172 pages, 3 x 4¾ inches; published by Penton Publishing Co., Cleveland 13, for $1.

Of vestpocket size, this volume contains a complete port directory, shipyard directory, dimensions and capacity of bulk freighters for the 1945 Great Lakes season. More than 1500 vessels available for service are listed, giving management, chief operating personnel and in case of bulk freighters technical data such as keel length, beam, depth, distance between hatches and carrying capacity at 20-foot draft.

An alphabetical list makes it easy to find the name of owner, captain or engineer of each ship. This directory is the recognized authority on Great Lakes fleets.

Refutes New Deal Concept Of Economic Maturity

The Bogey of Economic Maturity, by George Terborgh; cloth, 263 pages, 6 x 9 inches; published by Machinery & Allied Products Institute, 221 North LaSalle street, Chicago, for $3.

The author, an economist formerly connected with the Brookings Institution, discusses thoroughly the theory of economic maturity, developed by Dr. Alvin H. Hansen of Harvard University and used by the New Deal as justification for its deficit financing.

This theory cites four causes of an alleged shortage of investment opportunities, including decline of population growth, passing of the frontier, dearth of great new industries and increasing importance of depreciation reserves. The author of this study analyzes these at length and dismisses them as substantially harmless.

The conclusion is that there is no reason to expect chronic oversaving and economic debility because of these factors, there is no warrant for expecting a need for continuous government deficits as an economic stimulus.

Canadian Trade Index Available To Subscribers

Canadian Trade Index; cloth, 846 pages, 6½ x 10 inches; published by Canadian Manufacturers' Association Inc., Toronto, Ont., for $6.

The 1945 edition of this annual publication contains a thoroughly revised list of all Canadian manufacturers having more than local distribution and an export section giving basic information regarding government services, foreign trade controls, methods, financing, price quotations, export costs, Empire tariff preferences and a list of overseas supply missions in Canada and the United States. It also includes a French index of products. Special editions contain French and Spanish and French and Portuguese indexes.

Among changes in the 1945 edition are 241 additional firm names, 96 changes in name, 216 changes of address and location, 80 new classifications. The object of the publication is to provide buyers and sellers an authoritative directory of all products manufactured in Canada and names of firms making them. The index contains an alphabetical directory of more than 8000 Canadian manufacturers, with addresses, branches, export representatives, trademarks and brands; a directory of Canadian manufacturers classified according to products; a directory of exporters of agricultural products and allied lines.

Statistics of Metals

Metal Statistics, 1945, cloth, 800 pages, 4 x 6 inches, published by American Metal Market, 18 Cliff street, New York 7, for $2.

A mine of statistical information on ferrous and nonferrous metals, this volume is the 38th annual edition and follows the same plan as previous issues. A number of new tables have been included in the 1945 edition and widen the scope of its coverage.

Tables cover production, sales and prices of most of the metals, as well as scrap, fuels and ores.

—o—

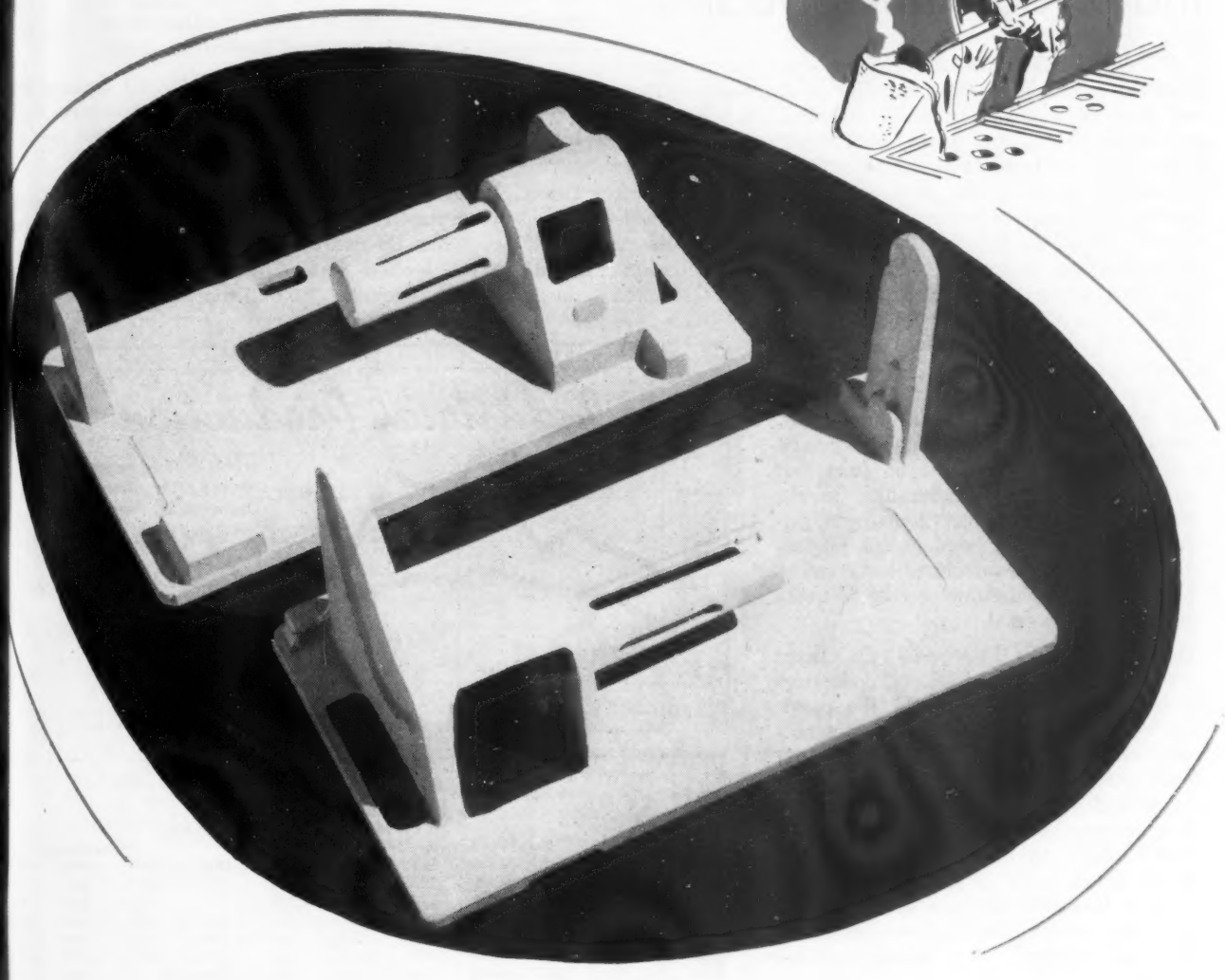
Core Increases Transformer Capacity

A 10 to 20 per cent increase in transformer short-time overload capacity with little sacrifice in voltage regulation in total losses at normal load is accomplished by using fewer turns (possible because the wound Hipersil core permits a smaller window), reducing the copper-to-iron ratio losses. This results in a unit tailored to wartime conditions, according to Westinghouse Electric Corp., Pittsburgh, Pa.

The coil, when baked with a heat-reactive varnish, becomes a solid mass of great mechanical strength, fortifying it against short-circuit stresses. The varnish is penetrating, low in acid, and oil resistant. Standard mountings, fittings, high and low-voltage connectors and other details are as specified by the EEI-NEMA distribution standardization.

A line of replacement high-voltage bushings, with modern disconnecting features and flashover co-ordinated to occur outside the case, also has been developed. These designs consist of bushing and lead assembly provided with an anti-siphon feature. They may be mounted in the tank by means of a special flange and spring arrangement. An old transformer rebuilt with these modern core and coils and replacement bushings is said to give the utilities an up-to-date unit in many respects.

They started in sand...



...now they're permanent-mold castings, being produced by Alcoa for Dictaphone

A lightweight machine was an innovation, public acceptance unknown, when Dictaphone first decided to use aluminum for these parts. Alcoa, therefore, started producing the parts as sand castings; it's much easier and less expensive to make design changes in patterns than in metal molds.

The lightweight Dictaphone took hold quickly. Quantities soon reached the range where it was more economical to produce parts as permanent-mold castings. Molds were made and Alcoa went into production. Today, Dictaphones are playing an important part in speeding military and civilian paper work.

If you're wondering about ways of helping your production, it should pay to consult Alcoa on the use of light metal permanent-mold castings. Write ALUMINUM COMPANY OF AMERICA, 2112 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA FIRST IN **ALUMINUM**

ALCOA ALUMINUM

THE BUSINESS TREND

Industrial Production Index Continues Decline

CONTINUED transition to lower levels of munitions output is reducing overall industrial production, the Federal Reserve Board's seasonally adjusted June industrial production index being down about 2 per cent from May. That index has been declining since February.

Although most of the decrease results from reduced activity in munitions industries, the Senate War Investigating Committee warned that industry's reconversion is not proceeding fast enough to protect the civilian economy during the transition period, and urged that productive capacity not needed for the Japanese war be speeded into peacetime channels.

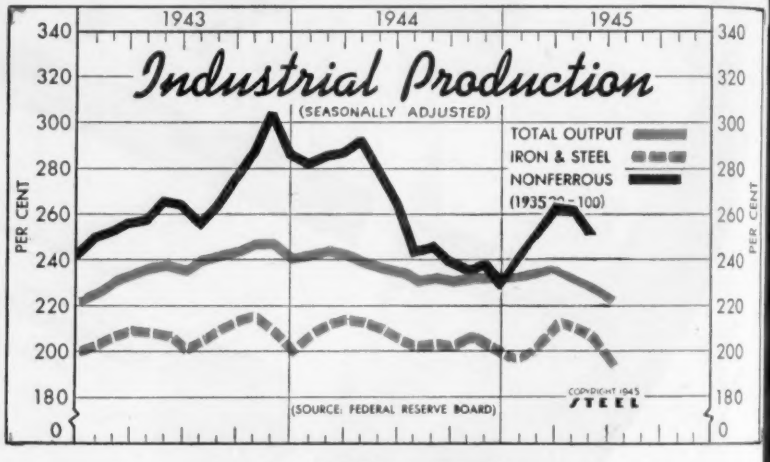
Reflecting some transition from a full war economy toward a peacetime basis, manufacturing of durable goods, principally war needs, declined in June but manufacturing of nondurable goods, mainly civilian items, remained unchanged. Likewise, employment in durable goods industries declined but employment in the nondurable goods factories continued unchanged.

STEEL PRODUCTION—In the latest week, most of the business indicators show moderate declines from the previous week. While current steel ingot output has been holding steady it is about 6 per cent below that of the corresponding period of last year, largely because of manpower shortage. To improve steel plants' ability to be of greatest possible aid in reconversion of industry, the Senate War Investigating Committee has proposed the release from the armed forces to the steel industry of a limited number of men.

ELECTRICITY—Manufacturing and extracting industries, including government plants such as arsenals, ordnance plants and Navy yards, estimate that in 1945 they will use more electric energy than was produced for all purposes in any year prior to 1940. Production in 1939, the peak year prior to 1940, totaled 161.3 billion kilowatt-hours while industrial use in 1945 will be about 161.7 billion kilowatt-hours. First three industries in the order of their estimated energy use are chemicals, iron and steel, and nonferrous metals.

STRUCTURAL STEEL—Reflecting pent-up demand for construction, June bookings of fabricated structural steel for bridges and buildings not only are the highest for any 1945 month but are the highest since July, 1942.

COAL PRODUCTION—While heated discussions continue over proposals to ship coal from the United States to Europe when the worst coal shortage of the war impends in the United States, bituminous coal output in the latest week declined 380,000 tons.



Federal Reserve Board's Production Indexes
(1935-39=100)

	Total Production			Iron, Steel			Nonferrous		
	1945	1944	1943	1945	1944	1943	1945	1944	1943
January	234	243	227	197	208	204	240	281	250
February	236	244	232	202	212	208	257	285	252
March	235	242	235	210	214	210	265	286	256
April	231	239	237	206	213	209	264	292	257
May	226	237	238	204	210	208	251	279	266
June	222	235	236	193	204	201	...	264	264
July	...	231	240	...	202	204	...	243	256
August	...	232	242	...	203	210	...	245	264
September	...	231	244	...	202	214	...	239	277
October	...	232	247	...	206	215	...	236	286
November	...	232	247	...	201	209	...	239	304
December	...	232	241	...	198	200	...	229	277
Average	...	236	239	...	206	208	...	260	267

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)	90.5	90	92	96
Electric Power Distributed (million kilowatt hours)	4,435	4,385	4,353	4,391
Bituminous Coal Production (daily av.—1000 tons)	1,937	2,000	1,961	1,995
Petroleum Production (daily av.—1000 bbls.)	4,930	4,944	4,903	4,608
Construction Volume (ENR—Unit $1,000,000)	$41.1	$50.1	$46.5	$41.1
Automobile and Truck Output (Ward's—number units)	16,105	18,080	19,115	19,620

*Dates on request.

TRADE				
Freight Carloadings (unit—1000 cars)	891†	882	894	911
Business Failures (Dun & Bradstreet, number)	22	12	14	19
Money in Circulation (in millions of dollars)‡	$26,926	$26,901	$26,628	$22,584
Department Store Sales (change from like week a year ago)‡	+14%	+15%	+21%	+11%

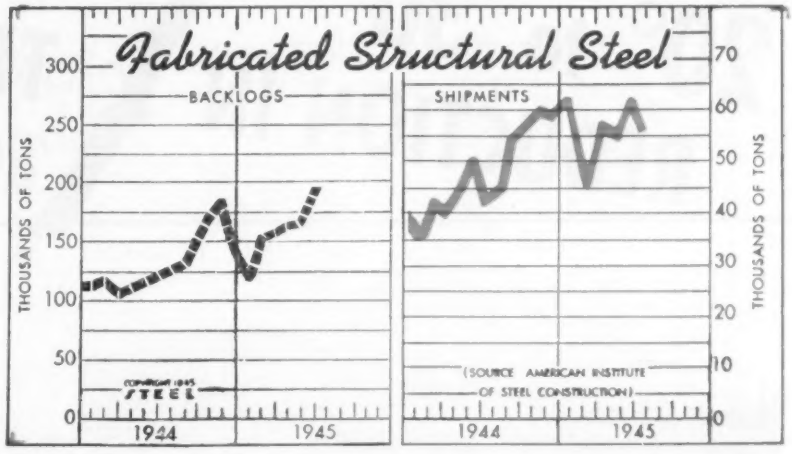
†Preliminary. ‡Federal Reserve Board.

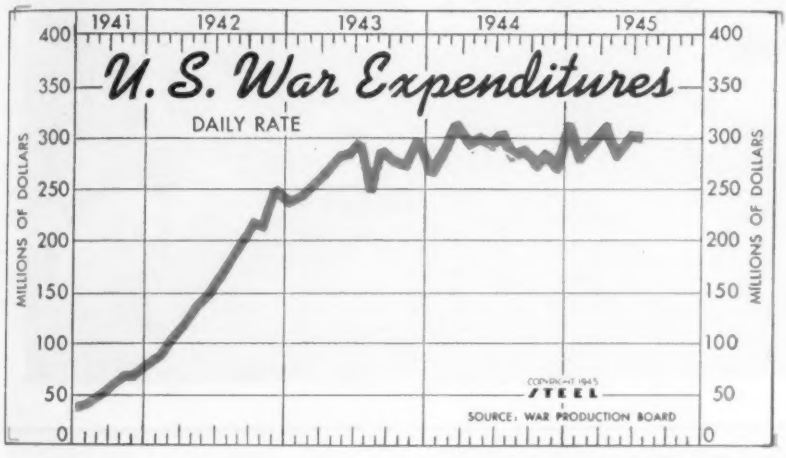
Fabricated Structural Steel

(1000 tons)

	Shipments			Backlogs		
	1945	1944	1943	1945	1944	1943
Jan.	54.5	35.2	91.9	124.4	113.1	339.1
Feb.	47.4	42.9	90.8	151.6	117.6	321.0
Mar.	57.6	41.4	94.0	153.3	106.3	299.8
Apr.	55.7	44.5	86.6	162.5	111.2	272.5
May	62.2	50.7	78.9	165.7	116.3	220.6
June	55.9	43.0	68.4	195.2	122.7	207.1
July	...	45.3	56.8	....	125.4	201.8
Aug.	...	55.2	50.2	....	130.4	195.6
Sept.	...	57.5	51.8	....	151.1	208.1
Oct.	...	61.6	80.1	....	174.4	274.0
Nov.	...	59.4	42.7	....	184.2	134.6
Dec.	...	61.3	39.6	....	142.5	113.0

Source: American Institute of Steel Construction. Figures represent members' reports only.





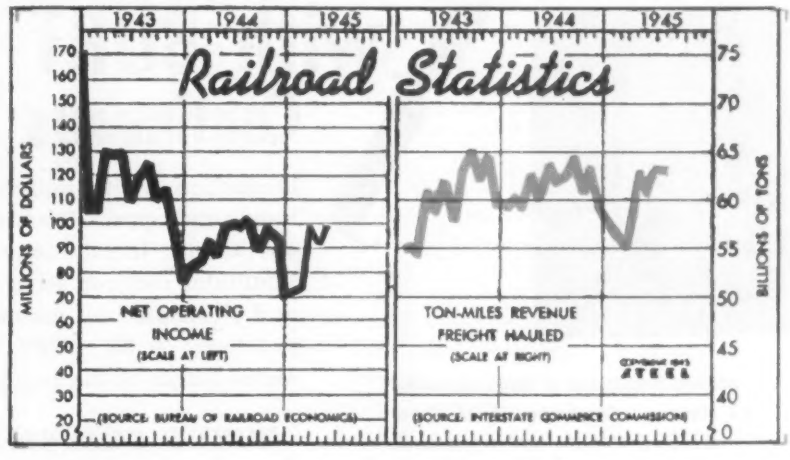
War Expenditures

(millions)

	1945		1944	
	Monthly Expenditures	Daily Rate	Monthly Expenditures	Daily Rate
Jan.	$7,519	$278.4	$7,416	$285 2
Feb.	6,965	290.2	7,808	312.3
March ...	8,318	308.1	7,948	294.4
April ...	7,045	281.8	7,493	299.7
May	8,166	302.5	7,918	293.3
June	7,885	303.4	7,957	306.0
July	....	....	7,355	282.9
Aug.	....	....	7,798	288.8
Sept.	....	....	7,104	273.2
Oct.	....	....	7,447	286.4
Nov.	....	....	7,095	272.9
Dec.	....	....	7,835	313.4
Total ...	....	....	91,174	Ave. 292.2

Statistics of Class I Railroads

	Net Operating Income			Ton-Miles Revenue Freight		
	1945	1944	1943	1945	1944	1943
	(millions)			(billions)		
Jan.	$73.0	$84.9	$105.3	56.8	60.5	55.1
Feb.	73.2	84.5	105.8	55.3	59.3	54.4
Mar.	99.9	92.5	129.7	62.9	62.7	61.2
Apr.	91.9	87.7	128.7	61.6	60.4	59.1
May	99.9	98.5	129.5	64.6	64.0	62.1
June	...	99.8	109.0	63.6	62.0	58.0
July	...	98.6	127.8	...	62.8	63.7
Aug.	...	101.4	132.3	...	64.5	65.1
Sept. ...	...	89.1	110.3	...	61.0	62.5
Oct.	...	97.3	113.1	...	63.5	65.0
Nov.	...	91.6	96.4	...	59.4	59.9
Dec.	...	69.8	76.9	...	57.3	60.6
Ave.	...	$93.1	$113.5	...	61.5	60.6



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$10,552	$11,850	$12,745	$9,961
Federal Gross Debt (billions)	$262.0	$261.8	$256.9	$209.1
Bond Volume, NYSE (millions)	$25.0	$28.8	$46.0	$36.8
Stocks Sales, NYSE (thousands)	4,374	5,229	11,234	4,153
Loans and Investments (billions)†	$64.0	$64.2	$63.0	$57.3
United States Government Obligations Held (millions)†	$47,267	$47,338	$46,334	$42,424

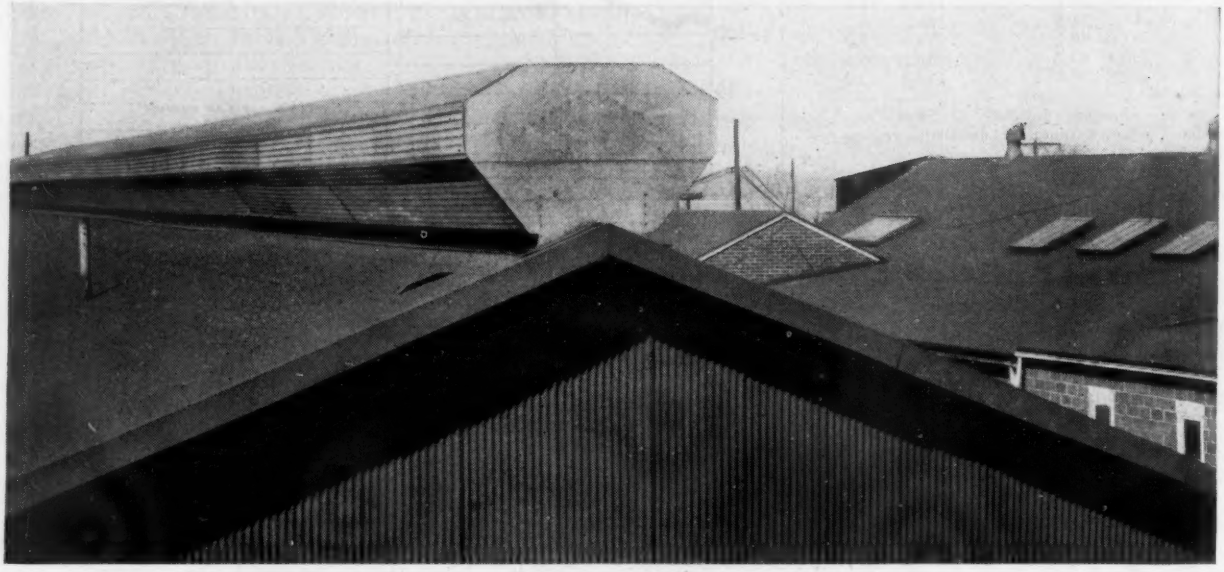
†Member banks, Federal Reserve System.

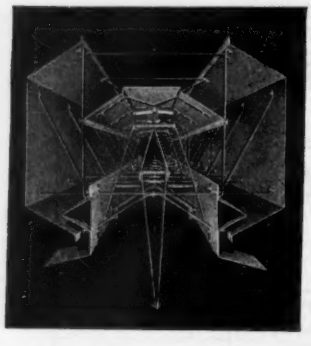
PRICES

STEEL's composite finished steel price average	$58.27	$58.27	$58.27	$56.73
All Commodities†	105.6	105.6	105.9	103.9
Industrial Raw Materials†	117.7	117.6	118.6	113.8
Manufactured Products†	101.9	101.9	102.0	101.1

†Bureau of Labor Statistics Index, 1926 = 100.

20° to 30° REDUCTION IN TEMPERATURES at Working Levels





with BURT MONOVENT Continuous Ridge Ventilator

Production of vital military parts at this plant was impaired by fumes and oppressive heat from their forging and heat-treating operations. Installation of a BURT Monovent Continuous Ridge Ventilator reduced temperatures at working levels 20° to 30° and eliminated all fumes—completely solved their ventilating problem. A 36" BURT Monovent was used here, along the entire length of the building—189 feet.

For uniform ventilation of large areas the BURT Monovent Continuous Ridge Ventilator is highly efficient and economical. Designed to install along the roof ridge, it harmonizes with roof lines for better appearance than unit ventilators. It is weatherproof, simple to operate and requires almost no maintenance. The BURT Monovent is serving in installations from 1 foot to 1,000 feet in length—from 4" to 72" throat sizes. It may be the answer to your ventilating problem.

BURT engineers will be glad to help you lay out plans and submit specifications without obligation. See Sweet's or write for detailed information.

BURT'S *COMPLETE* LINE HAS THE ANSWER TO YOUR VENTILATING PROBLEMS

The BURT line includes fan, gravity, revolving head and continuous ridge type ventilators. Recommendations are made, without bias, for the types that best answer your problems. BURT Ventilators are designed and engineered from the experience of more than half a century of manufacturing ventilators — production know-how that guarantees a high quality product that delivers maximum performance at minimum cost.

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SEND FOR CATALOGS
Burt Engineers are glad to help on plans

Steel Demand, Production Hold in Face of Cutbacks

Conditions better than foreseen at end of European war . . . Heavy war needs continue . . . Unrated orders form postwar cushion

WHILE overall pressure for steel is easier, heavy requirements still burden mill books and operating rates have reached midsummer without having gone more than a trifle below 90 per cent of capacity with prospects promising for continued active demand for months ahead.

Trade leaders last spring, after the fall of Germany, predicted the major dip in steel ingot production would come not later than July or early August and would not go lower than 85 per cent while Japan remained fighting. This prediction is more than borne out by present conditions. Cancellations are being received more freely but there also is much new tonnage, especially considering the volume of unrated work awaiting scheduling.

Shell demand has been maintained in much better degree than expected and while the small ammunition program is off decidedly requirements of a number of larger projectiles, rockets and some types of bombs are still heavy. As long as shell needs are reasonably sustained steel production is not likely to meet a sharp dip.

Considerable activity continues in other war work, involving not only bars and shell forgings but sheets, strip, shapes, tubing and in better degree than expected even in plates, in spite of the decline in shipbuilding. Recently 84,000 tons of plates were quite unexpectedly placed with western mills for August rolling, for a Navy program, details of which have not been revealed. With equal suddenness 40,000 tons of shapes for the same program were placed for August production, 25,000 tons to one mill and 15,000 tons to another.

Unrated tonnage is accumulating, though less rapidly than in early summer, because of better appreciation of difficulty in getting definite delivery promise. Even in plates unrated tonnage has not been easy to place as had been expected. One eastern platemaker estimates that unrated plate bookings this quarter will not be more than 20 per cent of the total, if it reaches that level.

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Aug. 4	Change	Same Week 1944	Same Week 1943
Pittsburgh	87.5	None	91	100
Chicago	94.5	−0.5	100.5	98
Eastern Pa.	87	+1	94	93
Youngstown	90	None	95	98
Wheeling	91.5	None	92.5	94
Cleveland	75.5	−15	93.5	94
Buffalo	83.5	−7	90.5	90.5
Birmingham	95	None	95	95
New England	86	None	80	97
Cincinnati	94	+2	82	89
St. Louis	68	None	87	89
Detroit	83	None	86	87
Average	89.5	−1	97	98

*Based on steelmaking capacities as of these dates.

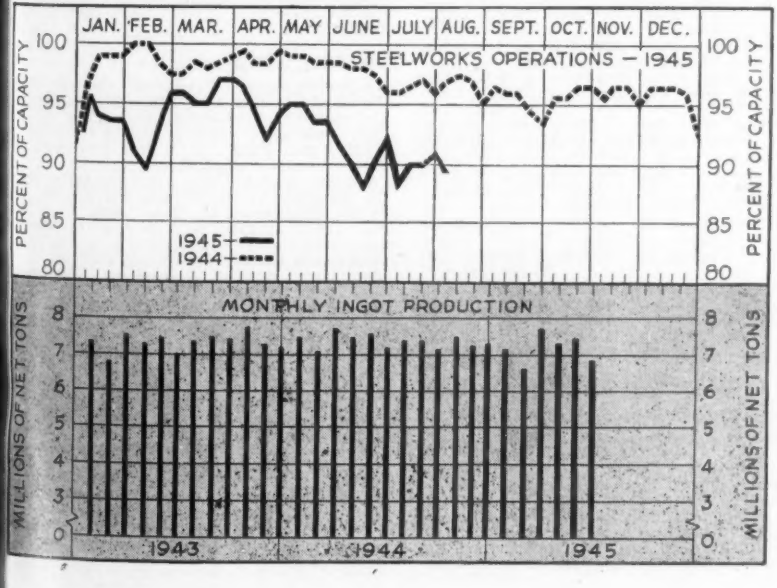
With few changes in operating rates in various districts, a strike cutting production by a large interest at Cleveland caused the estimated national operating rate to drop 1 point to 89½ per cent of capacity. Cleveland rate dropped 15 points to 75½ per cent. Other losses were 7 points at Buffalo to 83½ and ½-point at Chicago, to 94½. The only offsets were a rise of 1 point at eastern Pennsylvania, to 87 and 2 points at Cincinnati, to 94. Other districts showed no change, as follows: Pittsburgh 87½; Youngstown 90; St. Louis 68; Wheeling 91½; Birmingham 95; New England 86; Detroit 83.

To correct the inequality caused by the recent advance of $2 per ton on hot-rolled carbon bars without an equivalent increase on cold-finished, Office of Price Administration has allowed the ceiling on cold-finished to be raised $2 per ton. However, this is accompanied by elimination of certain extras which were charged previously. This is the first compensatory price action taken by OPA on steel products since government price control was effected. OPA also has permitted warehouses to pass along this increase on cold-finished bars to their customers.

Pig iron supply has been sufficient for current needs, although no surplus is being produced. Hot weather and lack of workers limits foundry consumption though much business is being offered which can not be booked.

Scrap scarcity continues and some steelmakers are operating close to the end of their supply, with difficulty in obtaining sufficient shipments to carry on from day to day. As a result of limited supply of preferred grades for steelmaking heavier demand is being placed on borings and turnings.

Average composite prices of steel and iron products are unchanged, at ceiling prices. Finished steel average composite is $58.27, semifinished steel $37.80, steelmaking pig iron $24.05 and steelmaking scrap $19.17.



COMPOSIT MARKET AVERAGES

	Aug. 4	July 28	July 21	One Month Ago July, 1945	Three Months Ago May, 1945	One Year Ago Aug., 1944	Five Years Ago Aug., 1940
Finished steel	$58.27	$58.27	$58.27	$58.27	$57.73	$56.73	$56.73
Semifinished Steel	37.80	37.80	37.80	37.80	36.45	36.00	36.00
Steelmaking Pig Iron	24.05	24.05	24.05	24.05	24.05	23.05	22.05
Steelmaking Scrap	19.17	19.17	19.17	19.07	19.13	19.17	18.65

Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic p.g iron prices at bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; other, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material	Aug. 4, 1945	July, 1945	May, 1945	Aug., 1944
Steel bars, Pittsburgh	2.25c	2.25c	2.20c	2.15c
Steel bars, Philadelphia	2.57	2.57	2.49	2.47
Steel bars, Chicago	2.25	2.25	2.17	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.25	2.25	2.22	2.10
Plates, Philadelphia	2.30	2.30	2.26	2.15
Plates, Chicago	2.25	2.25	2.22	2.10
Sheets, hot-rolled, Pittsburgh	2.20	2.20	2.20	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.70	3.70	3.65	3.50
Sheets, hot-rolled, Gary	2.20	2.20	2.20	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.70	3.70	3.65	3.50
Bright bess., basic wire, Pittsburgh	2.75	2.75	2.64	2.60
Tin plate, per base box, Pittsburgh	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.90	2.90	2.82	2.55

Semifinished Material				
Sheet bars, Pittsburgh, Chicago	$36.00	$36.00	$34.50	$34.00
Slabs, Pittsburgh, Chicago	36.00	36.00	34.50	34.00
Rerolling billets, Pittsburgh	36.00	36.00	34.50	34.00
Wire rods, No. 5 to ⅜-inch, Pitts.	2.15	2.15	2.05	2.00

Pig Iron	Aug. 4, 1945	July, 1945	May, 1945	Aug., 1944
Bessemer, del. Pittsburgh	$26.19	$26.19	$26.19	$25.19
Basic, Valley	24.50	24.50	24.50	23.50
Basic, eastern del. Philadelphia	26.34	26.34	26.34	25.34
No. 2 fdry., del. Pitts., N.&S. Sides	25.69	25.69	25.69	24.69
No. 2 foundry, Chicago	25.00	25.00	25.00	24.00
Southern No. 2, Birmingham	21.38	21.38	21.38	20.38
Southern No. 2 del. Cincinnati	25.30	25.30	25.30	24.30
No. 2 fdry., del. Phila.	26.84	26.84	26.84	25.84
Malleable, Valley	25.00	25.00	25.00	24.00
Malleable, Chicago	25.00	25.00	25.00	24.00
Lake Sup., charcoal del. Chicago	37.34	37.34	37.34	37.34
Gray forge, del. Pittsburgh	25.19	25.19	25.19	24.19
Ferromanganese, del. Pittsburgh	140.33	140.33	140.33	140.33

Scrap				
Heavy melting steel, No. 1 Pittsburgh	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.56	18.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	20.00

Coke				
Connellsville, furnace, ovens	$7.50	$7.50	$7.00	$7.00
Connellsville, foundry ovens	8.25	8.25	7.75	7.75
Chicago, by-product fdry., del.	13.35	13.35	13.35	13.35

STEEL, IRON RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941, Feb. 4, 1942 and May 21, 1945. The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding etc., although only principal established basing points for selected products are named specifically. Seconds and off-grade products are also covered. Exceptions applying to individual companies are noted in the table. Finished steel quoted in cents per pound.

Semifinished Steel

Gross ton basis except wire rods, skelp.

Carbon Steel Ingots: F.o.b. mill base, rerolling qual., stand. analysis, $31.00.
(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel ingots at $33 gross ton f.o.b. mill Kaiser Co. Inc., $43, f.o.b. Pacific ports.)

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon; uncrop, $45.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $36; Detroit, del. $38; Duluth (bil) $38; Pac. Ports, (bil) $48. (Andrews Steel Co., carbon slabs $41; Continental Steel Corp., billets $34, Kokomo, to Acme Steel Co.; Northwestern Steel & Wire Co., $41, Sterling, Ill.; Laclede Steel Co., $34 Alton or Madison, Ill.; Wheeling Steel Corp. $36 base, billets for lend-lease, $34, Portsmouth, O., on slabs on WPB directives. Granite City Steel Co. $47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co., Kaiser Co. Inc., $58.64, Pac. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $42. Detroit, del. $44; Duluth, billets, $44; forg. bil. f.o.b. Pac. ports, $54.
(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points; Follansbee Steel Corp., $49.50 f.o.b. Toronto, O. Geneva Steel Co., Kaiser Co. Inc., $64.64, Pacific ports.)

Open Hearth Shell Steel: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Youngstown, Birmingham, base 1000 tons one size and section; 3-12 in., $52; 12-18 in., excl., $54.00; 18 in. and over $56. Add $2.00 del. Detroit; $3.00 del. Eastern Mich. (Kaiser Co. Inc., $76.64, f.o.b. Los Angeles.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $54, del. Detroit $56, Eastern Mich. $57.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $36. (Wheeling Steel Corp. $37 on lend-lease sheet bars, $38 Portsmouth, O., on WPB directives; Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, $39, f.o.b. mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb., 1.90c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—⅜ in. inclusive, per 100 lbs., $2.15 Do., over ⅜—47/64-in., incl., $2.30; Galveston, base, 2.25c and 2.40c, respectively. Worcester add $0.10; Pacific ports $0.50 (Pittsburgh Steel Co., $0.20 higher.)

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3": Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham base 20 tons one size, 2.25c; Duluth, base 2.35c; Mahoning Valley 2.32½c; Detroit, del. 2.35c; Eastern Mich. 2.40c; New York del. 2.59c; Phila. del. 2.57c; Gulf Ports, dock 2.62c; Pac. ports, dock 2.90c. (Calumet Steel Division. Borg-Warner Corp., and Joslyn Mfg. & Supply Co., may quote 2.35c, Chicago base; Sheffield Steel Corp., 2.75c, f.o.b. St. Louis.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.)

Hot-Rolled Alloy Bars: Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c; Detroit, del., 2.80c.
(Texas Steel Co. may use Chicago base price as maximum f.o.b. Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.10	4100 (.15-.25 Mo)	0.70
		(.20-.30 Mo)	0.75
2300	1.70	4300	1.70
2500	2.55	4600	1.20
3000	0.50	4800	2.15
3100	0.85	5100	0.35
3200	1.35	5130 or 5152	0.45
3400	3.20	6120 or 6152	0.95
4000	0.45-0.55	6145 or 6150	1.20

*Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.75c; Detroit 2.80c; Toledo 2.90c. (Keystone Drawn Steel Co. may sell outside its usual market area on Proc. Div., Treasury Dept. contracts at 2.65c, Spring City, Pa., plus freight on hot-rolled bars from Pittsburgh to Spring City, New England Drawn Steel Co. may sell outside New England on WPB directives at 2.65c, Mansfield, Mass., plus freight on hot-rolled bars from Buffalo to Mansfield.)

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit, del. 3.45c; Eastern Mich. 3.50c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.25c; Eastern Mich. and Toledo 2.30c; Gulf ports, dock 2.50c; Pacific ports, dock 2.55c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo base 2.15c; Detroit, del. 2.25c; Eastern Mich. and Toledo 2.30c; Gulf ports, dock 2.50c.

Iron Bars: Single refined, Pitts. 4.40c; double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, single ref., 5.00, double ref., 6.25c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.20c; Granite City, base 2.30c; Detroit del. 2.30c; Eastern Mich. 2.35c; Phila. del. 2.37c; New York del. 2.44c; Pacific ports 2.75c.
(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 2.35c on hot carbon sheets, nearest eastern basing point.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.05c; Granite City, base 3.15c; Detroit del. 3.15c; Eastern Mich. 3.20c; New York del. 3.39c; Phila. del. 3.37c; Pacific ports 3.70c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.70c; Granite City, base 3.80c; New York del. 3.94c; Phila. del. 3.87c; Pacific ports 4.25c.
(Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29 gage, per square 3.36c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage not corrugated, copper alloy 3.60c; Granite City 3.70c; Pacific ports 4.25c; copper iron, 3.90c; pure iron 3.95c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.25c.

Enameling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 2.85c; Granite City, base 2.95c; Detroit, del. 2.95c; eastern, Mich. 3.00c; Pacific ports 3.50c; **20-gage;** Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.45c; Detroit del. 3.55c; eastern Mich. 3.60c; Pacific ports 4.10c.

Electrical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.30c	4.05c	3.30c
Armature	3.65c	4.40c	3.75c
Electrical	4.15c	4.90c	4.25c
Motor	5.05c	5.80c	5.15c
Dynamo	5.75c	6.50c	5.85c
Transformer			
72	6.25c	7.00c	.....
65	7.25c	8.00c	.....
58	7.75c	8.50c	.....
52	8.55c	9.30c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base 1 ton and over, 12 inches wide and less 2.10c; Detroit del. 2.20c; Eastern Mich. 2.25c; Pacific ports 2.75c. (Joslyn Mfg. Co. may quote 2.30c, Chicago base.)

Cold Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c; Chicago, base 2.90c; Detroit, del. 2.90c; Eastern Mich. 2.95c; Worcester base 3.00c.

Commodity C. R. Strip: Pittsburgh, Cleveland, Youngstown, base 3 tons and over, 2.95c; Chicago 3.05c; Detroit del. 3.05c; Eastern Mich. 3.10c; Worcester base 3.35c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland bases, add 20c for Worcester; .26-.50 Carb., 2.80c; .51-.75 Carb., 4.30c; .76-1.00 Carb., 6.15c; over 1.00 Carb., 8.35c.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb. base box, $5.00; Granite City $5.10.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb. base box, 0.50 lb. tin, $4.50; 0.75 lb. tin $4.65.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29 gage and lighter, 3.05c; Granite City, 3.15c; Pacific ports, boxed 4.05c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted 3.80c; Pacific ports 4.55c.

Manufacturing Ternes: (Special Coated) Pittsburgh, Chicago, Gary, 100-base box $4.30; Granite City $4.40.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb. $12.00; 15-lb. $14.00; 20-lb. $15.00; 25-lb. $16; 30-lb $17.25; 40-lb. $19.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.25c; New York, del. 2.44c; Phila., del. 2.30c; St. Louis, 2.49c; Boston, del. 2.57-82c; Pacific ports, 2.80c; Gulf ports, 2.60c.

(Granite City Steel Co. may quote carbon plates 2.35c f.o.b. mill; 2.65c f.o.b. D.P.C. mill; Kaiser Co. Inc., 3.20c, f.o.b. Los Angeles. Central Iron & Steel Co. 2.50c f.o.b. basing points; Geneva Steel Co., Provo, Utah, 3.20c, f.o.b. Pac. ports.)

Floor Plates: Pittsburgh, Chicago, 3.50c; Pacific ports, 4.15c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.50c; Gulf ports 3.95c; Pacific ports 4.15c.

Wrought Iron Plates: Pittsburgh, 3.80c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.10c; New York, del. 2.27c; Phila., del. 2.215c; Pacific ports, 2.75c.

(Phoenix Iron Co., Phoenixville, Pa., may quote carbon steel shapes at 2.35c at established basing points and 2.50c, Phoenixville, for export; Sheffield Steel Corp., 2.55c f.o.b. St. Louis. Geneva Steel Co., 3.25c, Pac. ports; Kaiser Co. Inc., 3.20c f.o.b. Los Angeles).

Steel Sheet Piling: Pittsburgh, Chicago, Buffalo, 2.40c.

Wire Products, Nails

Wire: Pittsburgh, Chicago, Cleveland, Birmingham (except spring wire) to manufacturers in carloads (add $2 for Worcester, $1 for Duluth).

Bright basic, bessemer wire 2.75c
Spring wire 3.35c
(Pittsburgh Steel Co., 0.20c higher.)

Wire Products to the Trade:

Standard and Cement-coated wire nails, and staples, 100-lb. keg, Pittsburgh, Chicago, Birmingham, Cleveland, Duluth $2.90; galvanized, $2.55; Pac. ports ..... $3.40 and $3.05
Annealed fence wire, 100-lb., Pittsburgh, Chicago, Cleveland 3.20c
Galvanized fence wire, 100 lb., Pittsburgh, Chicago, Cleveland 3.55c
Woven fence, 15½ gage and heavier, per base column ..... .67c
Barbed wire, 80-rod spool, Pittsburgh, Chicago, Cleveland, Birmingham, column 70; twisted barbless wire, column 70.

Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
⅛	56	33	½	24	.....
¼ & ⅜	59	40½	⅜	30	10
½	63½	51	1-1¼	34	16
¾	66½	55	1½	38	18½
1-3	68½	57½	2	37½	18

Lap Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
2	61	49½	1¼	23	3½
2½-3	64	54½	1½	28½	10
3½-6	66	54½	2	30½	12
7-8	65	52½	2½, 3½	31½	14½
9-10	64½	52	4	33½	18
11-12	63½	51	4½-8	32½	17
			9-12	28½	12

Boiler Tubes: Net base prices per 100 feet f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D. Sizes	B.W.G	—Seamless— Hot Rolled	Cold Drawn	—Lap Weld— Steel	Charcoal Iron
1"	13	$ 7.82	$ 9.01	.....	.....
1¼"	13	9.26	10.67	.....	.....
1½"	13	10.23	11.72	$ 9.72	$23.71
1¾"	13	11.64	13.42	11.06	22.93
2"	13	13.04	15.03	12.38	19.35
2¼"	13	14.54	16.76	13.79	21.63
2¼"	12	16.01	18.45	15.16	.....
2½"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
3½"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4½"	10	37.35	43.04	35.22	.....
5"	9	46.87	54.01	44.25	73.93
6"	7	71.96	82.93	68.14	.....

Rails, Supplies

Standard rails, over 60-lb., f.o.b. mill, gross ton, $43.00. Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, $45.00.

Relaying rails, 35 lbs. and over, f.o.b. railroad and basing points, $31-$33.

Supplies: Track bolts, 4.75c; heat treated, 5.00c. Tie plates, $46 net ton, base, Standard spikes, 3.25c.

*Fixed by OPA Schedule No. 46, Dec. 15, 1941.

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, base, cents per lb.; Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high car.-chr. 43.00c.

Tung.	Chr.	Van.	Moly.	Pitts. base per lb.
18.00	4	1	.	67.00c
1.5	4	1	8.5	54.00c
...	4	2	8	54.00c
6.40	4.15	1.90	5	57.50c
5.50	4.50	4	4.50	70.00c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
CHROMIUM NICKEL STEEL					
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	.....	.....
*316	40.00	44.00	48.00	40.00	48.00
†321	29.00	34.00	41.00	29.25	38.00
‡347	33.00	38.00	45.00	33.00	42.00
431	19.00	22.00	29.00	17.50	22.50
STRAIGHT CHROMIUM STEEL					
403	21.50	24.50	29.50	21.25	27.00
**410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
††420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
‡‡420F	19.50	22.50	29.50	18.75	24.50
440A	24.00	28.50	33.50	23.75	36.50
442	22.50	25.50	32.50	24.00	32.00
443	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00
STAINLESS CLAD STEEL (20%)					
304	.....	§§18.00	19.00	.....	.....

*With 2-3% moly. †With titanium. ‡With columbium. **Plus machining agent. ††High carbon. ‡‡Free machining. §§Includes annealing and pickling.

Basing Point Prices are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under (1) except to the extent prevailing in third quarter of 1940.

Extras mean additions or deductions from base prices in effect April 16, 1941.

Delivered prices applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are deemed basing points except in the case of the latter two areas when water transportation is not available, in which case nearest basing point price plus all-rail freight may be charged.

Domestic Ceiling prices are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. **Governing basing point** is basing point nearest the consumer providing the lowest delivered price.

Seconds, maximum prices: flat-rolled rejects 75% of prime prices, wasters 75%, waste-wasters 65% except plates, which take waster prices; tin plate $2.80 per 100 lbs.; terne plate $2.25; semifinished 85% of primes; other grades limited to new material ceilings.

Export ceiling prices may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941.

Bolts, Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%

Carriage and Machine

½ x 6 and smaller ..... 65½ off
Do., ⅝ and ¾ x 6-in. and shorter... 63½ off
Do., ¾ to 1 x 6-in. and shorter ..... 61 off
1¼ and larger, all lengths ..... 59 off
All diameters, over 6-in. long ..... 59 off
Tire bolts ..... 50 off
Step bolts ..... 56 off
Plow bolts ..... 65 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Nuts

Semifinished hex	U.S.S.	S.A.E.
⅞-inch and less	62	64
½-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger	56	

Hexagon Cap Screws

Upset 1-in., smaller ..... 64 off
Milled 1-in., smaller ..... 60 off

Square Head Set Screws

Upset, 1-in., smaller ..... 71 off
Headless, ¼-in., larger ..... 60 off
No. 10, smaller ..... 70 off

Piling

Pittsburgh, Chicago, Buffalo 2.40c

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham

Structural 3.75c
⅞-inch and under ..... 65-5 off
Wrought, Washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers l.c.l.... $2.75-3.00 off

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	*7.50
Connellsville, foundry	8.00- 8.50
New River, foundry	9.00- 9.25
Wise county, foundry	7.75- 8.25
By-Product Foundry	
Wise county, furnace	7.25- 7.75
Kearney, N. J., ovens	12.65
Chicago, outside delivered	12.60
Chicago, delivered	13.35
Terre Haute, delivered	13.10
Milwaukee, ovens	13.35
New England, delivered	14.25
St. Louis, delivered	†13.35
Birmingham, delivered	10.50
Indianapolis, delivered	13.10
Cincinnati, delivered	12.85
Cleveland, delivered	12.80
Buffalo, delivered	13.00
Detroit, delivered	13.35
Philadelphia, delivered	12.88

*Operators of hand-drawn ovens using trucked coal may charge $8.00, effective May 26, 1945.
†13.85 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	15.00c
Toluol, two degree	28.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c
Per lb. f.o.b. works	
Phenol (car lots, returnable drums)	12.50c
Do., less than car lots	13.25c
Do., tank cars	11.50c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls., to jobbers	8.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$29.20

VOLU

TIGHTLY

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LABLE

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras.

	Hot rolled bars	Structural shapes	Plates	Floor plates	Hot rolled sheets (10 gage base)	Hot rolled bands (12 gage and heavier)	Hot rolled hoops (14 gage and lighter)	Galvanized flat sheets (24 gage base)	Cold-rolled sheets (17 gage base)	Cold finished bars	Cold-rolled strip	NE hot bars 8600 series	NE hot bars 9400 series
Boston	4.044[1]	3.912[1]	3.912[1]	5.727[1]	3.774[1]	4.106[1]	5.106[1]	5.224[14]	4.744[14]	4.244[11]	4.715	6.012[23]	6.012[23]
New York	3.853[1]	3.758[1]	3.768[1]	5.574[1]	3.590[1]	3.974[1]	3.974[1]	5.010[13]	4.613[14]	4.203[21]	4.774	.....	.....
Jersey City	3.853[1]	3.747[1]	3.768[1]	5.574[1]	3.590[1]	3.974[1]	3.974[1]	5.010[13]	4.613[14]	4.203[21]	4.774	.....	.....
Philadelphia	3.822[1]	3.666[1]	3.605[1]	5.272[1]	3.518[1]	3.922[1]	4.272[1]	5.018[15]	4.872[25]	4.172[21]	4.772	5.816[23]	5.860[23]
Baltimore	3.802[1]	3.759[1]	3.594[1]	5.252[1]	3.394[1]	3.902[1]	4.252[1]	4.894[1]	4.852[25]	4.152[21]	.....	.....	.....
Washington	3.941[1]	3.930[1]	3.796[1]	5.341[1]	3.596[1]	4.041[1]	4.391[1]	5.196[17]	4.841[20]	4.141[21]	.....	.....	.....
Norfolk, Va.	4.065[1]	4.002[1]	3.971[1]	5.465[1]	3.771[1]	4.165[1]	4.515[1]	5.371[17]	4.965[24]	4.265[21]	.....	.....	.....
Bethlehem, Pa.*	.....	3.45[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del.*	.....	.....	3.45[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.*	.....	.....	3.45[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.35[1]	3.40[1]	3.63[1]	5.26[1]	3.35[1]	3.819[1]	3.819[1]	4.75[15]	4.40[10]	3.85[21]	4.669	5.60[23]	5.75[23]
Buffalo (country)	3.25[1]	3.30[1]	3.30[1]	4.90[1]	3.25[1]	3.81[1]	3.50[1]	4.65[15]	4.30[10]	3.75[21]	4.35	5.60[23]	5.75[23]
Pittsburgh (city)	3.35[1]	3.40[1]	3.40[1]	5.00[1]	3.35[1]	3.60[1]	3.60[1]	4.75[12]	4.40[24]	3.85[21]	.....	.....	.....
Pittsburgh (country)	3.25[1]	3.30[1]	3.30[1]	4.90[1]	3.25[1]	3.50[1]	3.50[1]	4.65[12]	4.30[24]	3.75[21]	.....	.....	.....
Cleveland (city)	3.35[1]	3.588[1]	3.40[1]	5.188[1]	3.35[1]	3.60[1]	3.60[1]	4.877[12]	4.40[24]	3.85[21]	4.45[21]	5.60[23]	5.65[23]
Cleveland (country)	3.25[1]	.....	3.30[1]	.....	3.25[1]	3.50[1]	3.50[1]	.....	4.30[24]	3.75[21]	4.35[21]	.....	.....
Detroit	3.450[1]	3.661[1]	3.609[1]	5.281[1]	3.450[1]	3.700[1]	3.700[1]	5.000[12]	4.500[24]	3.900[21]	4.659	5.93[23]	5.93[23]
Omaha (city, delivered)	4.115[1]	4.165[1]	4.165[1]	5.765[1]	3.865[1]	4.215[1]	4.215[1]	5.608[19]	5.443[24]	4.543[12]	.....	.....	.....
Omaha (country, base)	4.015[1]	4.065[1]	4.065[1]	5.665[1]	3.765[1]	4.115[1]	4.115[1]	5.508[19]	.....	.....	.....	.....	.....
Cincinnati	3.611[1]	6.391[1]	3.661[1]	5.291[1]	3.425[1]	3.675[1]	3.675[1]	4.825[12]	4.475[24]	4.111[21]	4.711	6.10	6.20
Youngstown, O.*	.....	.....	.....	.....	.....	.....	.....	4.40[12]	.....	.....	.....	.....	.....
Middletown, O.*	.....	.....	.....	.....	3.25[1]	3.50[1]	3.50[1]	4.65[16]	.....	.....	.....	.....	.....
Chicago (city)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.25[1]	3.60[1]	3.60[1]	5.231[15]	4.20[24]	3.85[21]	4.65	5.75[23]	5.85[23]
Milwaukee	3.637[1]	3.687[1]	3.687[1]	5.287[1]	3.387[1]	3.737[1]	3.737[1]	5.272[15]	4.337[24]	3.987[21]	4.787	5.987[23]	6.087[23]
Indianapolis	3.58[1]	3.63[1]	3.63[1]	5.23[1]	3.518[1]	3.768[1]	3.768[1]	4.918[15]	4.568[24]	4.08[21]	4.78	6.08[23]	6.18[23]
St. Paul	3.76[2]	3.81[2]	3.81[2]	5.41[2]	3.51[2]	3.86[2]	3.86[2]	5.257[15]	4.46[24]	4.461[21]	5.102	6.09[23]	6.19[23]
St. Louis	3.647[1]	3.697[1]	3.697[1]	5.297[1]	3.397[1]	3.747[1]	3.747[1]	5.172[15]	4.347[24]	4.131[21]	4.931	6.131[23]	6.281[23]
Memphis, Tenn.	4.015[5]	4.065[5]	4.065[5]	5.78[5]	3.965[5]	4.215[5]	4.215[5]	5.265[15]	4.78[24]	4.43[21]	.....	.....	.....
Birmingham	3.50[1]	3.55[1]	3.55[1]	5.903[1]	3.45[1]	3.70[1]	3.70[1]	4.75[15]	4.852[24]	4.64	5.215	.....	.....
New Orleans (city)	4.10[4]	3.90[4]	3.90[4]	5.85[4]	4.058[4]	4.20[4]	4.20[4]	5.25[26]	5.079[10]	4.70[21]	5.429	.....	.....
Houston, Tex.	3.75[3]	4.25[3]	4.25[3]	5.50[9]	3.763[3]	4.313[3]	4.313[3]	5.313[26]	4.10[10]	3.75[21]	.....	.....	.....
Los Angeles	4.40[4]	4.65[4]	4.95[4]	7.20[4]	5.00[4]	4.95[4]	6.75[4]	6.00[12]	7.20[6]	5.683[22]	5.613	5.85[23]	5.95[23]
San Francisco	4.15[7]	4.35[7]	4.65[7]	6.35[7]	4.55[7]	4.50[7]	5.75[7]	6.35[15]	7.30[15]	5.433[21]	7.333	8.304[23]	8.404[23]
Portland, Oreg.	4.45[27]	4.45[27]	4.75[27]	6.50[27]	4.65[27]	4.75[27]	6.30[27]	5.75[15]	6.60[15]	5.633[15]	.....	.....	.....
Tacoma	4.35[6]	4.45[6]	4.75[6]	6.50[6]	4.65[6]	4.25[6]	5.45[6]	5.95[15]	7.60[15]	5.883[21]	.....	.....	8.00[23]
Seattle	4.35[6]	4.45[6]	4.75[6]	6.50[6]	4.65[6]	4.25[6]	5.45[6]	5.95[15]	7.05[15]	5.883[21]	.....	.....	8.00[23]

[1] *Basing point cities with quotations representing mill prices, plus warehouse spread.

NOTE—All prices fixed by Office of Price Administration in Amendments Nos. 10 to 33 to Revised Price Schedule No. 49. Deliveries outside above cities computed in accordance with regulations.

BASE QUANTITIES

[1]400 to 1999 pounds; [2]—400 to 14,999 pounds; [3]—any quantity; [4]—300 to 1999 pounds; [5]—400 to 8999 pounds; [6]—300 to 9999 pounds; [7]—400 to 39,999 pounds; [8]—under 2000 pounds; [9]—under 4000 pounds; [10]—500 to 1499 pounds; [11]—one bundle to 39,999 pounds; [12]—150 to 2249 pounds; [13]—150 to 1499 pounds; [14]—three to 24 bundles; [15]—450 to 1499 pounds; [16]—one bundle to 1499 pounds; [17]—one to nine bundles; [18]—one to six bundles; [19]—100 to 749 pounds; [20]—300 to 1999 pounds; [21]—1500 to 39,999 pounds; [22]—1500 to 1999 pounds; [23]—1000 to 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 pounds; [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; [27]—300 to 4999 pounds.

Ores

Lake Superior Iron Ore

Gross ton. 51½% (Natural) Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	13.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% f.o.b. Rio de Janeiro	7.50-8.00

Tungsten Ore

Chinese wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

(Equivalent OPA schedules):

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Ore., or Tacoma, Wash.

(S/S paying for discharging; dry basis; subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$41.00
48% 3:1	43.50
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80

Brazilian—nominal

44% 2.5:1 lump	33.65
48% 3:1 lump	43.50

Rhodesian

45% no ratio	28.30
48% no ratio	31.00
48% 3:1 lump	43.50

Domestic (seller's nearest rail)

48% 3:1	52.80

less $7 freight allowance

Manganese Ore

Sales prices of Metals Reserve Co., cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85.0c; Fontana, Calif., 91.0c; prices include duty on imported ore and are subject to premiums, penalties and other provisions of amended M.P.R. No. 248, effective as of May 15. Price at basing points which are also points of discharge of imported manganese ore is f.o.b. cars, shipside, at dock most favorable to the buyer.

Provo, Utah, and Pueblo, Colo.

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.7

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Designation	Chemical Composition Limits, Per Cent — Carbon	Mn.	Si.	Cr.	Ni.	Mo.	Basic open-hearth Electric furnace Bars per 100 lb.	Billets per GT	Bars per 100 lb.	Billets per GT
NE 8612	.10-.15	.70-.90	.20-.35	.40-.60	.40-.70	.15-.25	$0.65	$13.00	$1.15	$23.00
NE 8720	.18-.23	.70-.90	.20-.35	.40-.60	.40-.70	.20-.30	.70	14.00	1.20	24.00
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	.75	15.00	1.25	25.00
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.75	15.00	1.25	25.00
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.80	16.00	1.30	26.00
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.65	13.00	1.15	23.00
NE 9830	.28-.33	.70-.90	.20-.35	.70-.90	.85-1.15	.20-.30	1.30	26.00	1.80	36.00
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.20	24.00	1.55	31.00
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.20	24.00	1.55	31.00

Extras are in addition to a base price of 2.70c, per pound on finished products and $54 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

Pig Iron

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 10, effective June 10, 1941, amended Feb. 14, 1945. Exceptions indicated in footnotes. Base prices bold face, delivered light face. Federal tax on freight charges, effective Dec. 1, 1942, not included in following prices.

	Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$26.00	$25.50	$27.00	$26.50
Newark, N. J., del.	27.53	27.03	28.53	28.03
Brooklyn, N. Y., del.	28.50	...	...	29.00
Birdsboro, Pa., base	26.00	25.50	27.00	26.50
Birmingham, base	‡21.38	‡20.00	26.00	.....
Baltimore, del.	26.61	.....	.....	.....
Boston, del.	26.12	.....	.....	.....
Chicago, del.	25.22	.....	.....	.....
Cincinnati, del.	25.06	23.68	.....	.....
Cleveland, del.	25.12	24.24	.....	.....
Newark, N. J., del.	27.15	.....	.....	.....
Philadelphia, del.	26.46	25.96	.....	.....
St. Louis, del.	25.12	24.24	...	.....
Buffalo, base	25.00	24.00	26.00	25.50
Boston, del.	26.50	26.00	27.50	27.00
Rochester, del.	26.53	.....	27.53	27.03
Syracuse, del.	27.08	...	28.08	27.58
Chicago, base	25.00	24.50	25.50	25.00
Milwaukee, del.	26.10	25.60	26.60	26.10
Muskegon, Mich., del.	28.19	.	...	28.19
Cleveland, base	25.00	24.50	25.50	25.00
Akron, Canton, O., del.	26.39	25.89	26.89	26.39
Detroit, base	25.00	24.50	25.50	25.00
Saginaw, Mich., del.	27.31	26.81	27.81	27.31
Duluth, base	25.50	25.00	26.00	25.50
St. Paul, del.	27.63	27.13	28.13	27.63
Erie, Pa., base	25.00	24.50	26.00	25.50
Everett, Mass., base	26.00	25.50	27.00	26.50
Boston, del.	26.50	26.00	27.50	27.00
Granite City, Ill., base	25.00	24.50	25.50	25.00
St. Louis, del.	25.50	25.00	.....	25.50
Hamilton, O., base	25.00	24.50	.....	25.00
Cincinnati, del.	25.44	25.61	...	26.11
Neville Island, Pa., base	25.00	24.50	25.50	25.00
§Pittsburgh, del. No. & So. sides	25.69	25.19	26.19	25.69
Provo, Utah, base	23.00	22.50	.....	.....
Sharpsville, Pa., base	25.00	24.50	25.50	25.00
Sparrows Point, base	26.00	25.50	.....	.....
Baltimore, del.	26.99	.....	.....	.....
Steelton, Pa., base	...	25.50	...	26.50
Swedeland, Pa., base	26.00	25.50	27.00	26.50
Philadelphia, del.	26.84	26.34	...	27.34
Toledo, O., base	25.00	24.50	25.50	25.00
Youngstown, O., base	25.00	24.50	25.50	25.00
Mansfield, O., del.	26.94	26.44	27.44	26.94

Base grade, silicon 1.75-2.25%; add 50 cents for each additional 0.25% silicon, or portion thereof; deduct 50 cents for silicon below 1.75% on foundry iron. ‡For phosphorus 0.70% or over deduct 38 cents. §For McKees Rocks, Pa., add .55 to Neville Island base; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, .84; Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Brackenridge 1.24.

Note: Add 50 cents per ton for each 0.50% manganese or portion thereof over 1.00%.

Nickel differentials: Under 0.50%, no extra; 0.50% to 4.74% incl., $2 per ton; for each additional 0.25% nickel, $1 per ton.

High Silicon, Silvery

6.00-6.50 per cent (base)	$30.50		
6.51-7.00	$31.50	9.01- 9.50	36.50
7.01-7.50	32.50	9.51-10.00	37.50
7.51-8.00	33.50	10.01-10.50	38.50
8.01-8.50	34.50	10.51-11.00	39.50
8.51-9.00	35.50	11.01-11.50	40.50

F.o.b. Jackson county, O., per gross ton, Buffalo base prices are $1.25 higher. Prices subject to additional charge of 50 cents a ton for each 0.50% manganese in excess of 1.00%.

Electric Furnace Ferrosilicon: Sil. 14.01 to 14.50%, $45.50; each additional .50% silicon up to and including 18% add $1; low impurities not exceeding 0.05 Phos., 0.40 Sulphur, 1.0% Carbon, add $1.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton. (For higher silicon irons a differential over and above the price of base grades is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Charcoal Pig Iron

Northern

Lake Superior Furn. $34.00
Chicago, del. 37.34

Southern

Semi-cold blast, high phos., f.o.b. furnace, Lyles, Tenn. $28.50
Semi-cold blast, low phos., f.o.b. furnace, Lyles, Tenn. 33.00

Gray Forge

Neville Island, Pa. $24.50
Valley base 24.50

Low Phosphorus

Basing points: Birdsboro, Pa., $30.50; Steelton, Pa., and Buffalo, N. Y., 30.50 base; 31.74, del., Philadelphia. Intermediate phos., Central Furnace, Cleveland, $27.50

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differential: Basing point prices are subject to an additional charge not to exceed 50 cents a ton for each 0.25 silicon in excess of base grade (1.75 to 2.25%).

Phosphorus Differential: Basing point prices are subject to a reduction of 38 cents a ton for phosphorus content of 0.70% and over.

Ceiling Prices are the aggregate of (1) governing basing point (2) differentials (3) transportation charges from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in the lowest delivered price for the consumer.

Exceptions to Ceiling Prices: Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Foundry, Basic Bessemer and Malleable. Mystic Iron Works, Everett, Mass., may exceed basing point prices by $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky. $68.50

First Quality

Pa., Ill., Md., Mo., Ky.	54.40
Alabama, Georgia	54.40
New Jersey	59.35
Ohio	47.70

Second Quality

Pa., Ill., Md., Mo., Ky.	49.35
Alabama, Georgia	40.30
New Jersey	52.00
Ohio	38.15

Malleable Bung Brick

All bases 63.45

Silica Brick

Pennsylvania	54.40
Joliet, E. Chicago	62.45
Birmingham, Ala.	54.40

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	32.90
Wire cut	30.80

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Metallurgical grade, f.o.b. Ill., Ky., net tons, carloads CaF_2 content, 70% or more, $33; 65 but less than 70%, $32; 60 but less than 65% $31; less than 60%, $30. After Aug. 29 base price any grade $30.) war chemicals.

Ferroalloy Prices

Ferromanganese (standard) 78-82% c.l. gross ton, duty paid, $135; add $6 for packed c.l., $10 for ton, $13.50 less-ton, f.o.b. cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer; Rockdale or Rockwood, Tenn.; where Tennessee Products Co. is seller; Birmingham, Ala., where Sloss-Sheffield Steel & Iron Co. is seller; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%; delivered Pittsburgh. $140.33.

Ferromanganese (Low and Medium Carbon); per lb. contained manganese; eastern zone, low carbon, bulk, c.l., 23c; 2000 lb. to c.l., 23.40c; medium, 14.50c and 15.20c; central, low carbon, bulk, c.l., 23.30c; 2000 lb. to c.l., 24.40c; medium 14.80c and 16.20c; western, low carbon, bulk, c.l., 24.50c, 2000 lb. to c.l., 25.40c; medium, 15.75c and 17.20c; f.o.b. shipping point, freight allowed.

Spiegeleisen: 19-21% carlots per gross ton, Palmerton, Pa., $36; 16-19%, $35.

Electrolytic Manganese: 99.9% plus, less ton lots, per lb. 37.6 cents.

Chromium Metal: 97% min. chromium, max. .50% carbon, eastern zone, per lb. contained chromium bulk, c.l., 79.50c, 2000 lb. to c.l. 80c; central, 81c and 82.50c; western 82.25c and 84.75c; f.o.b. shipping point, freight allowed.

Ferrocolumbium: 50-60%, per lb. contained columbium in gross ton lots, contract basis, R.R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices 10 cents per lb. higher.

Ferrochrome: High carbon, eastern zone, bulk, c.l., 13c, 2000 lb. to c.l., 13.90c; central, add .40c and .65c; western, add 1c and 1.85c—high nitrogen, high carbon ferrochrome; Add 5c to all high carbon ferrochrome prices; all zones; low carbon eastern, bulk, c.l., max. 0.06% carbon, 23c, 0.10% 22.50c, 0.15% 22c, 0.20% 21.50c, 0.50% 21c, 1.00% 20.50c, 2.00% 19.50c; 2000 lb. to c.l., 0.06% 24c, 0.10% 23.50c, 0.15% 23c, 0.20% 22.50c, 0.50% 22c, 1.00% 21.50c, 2.00% 20.50c; central, add .4c for bulk, c.l. and .65 for 2000 lb. to c.l.; western, add 1c for bulk, c.l. and 1.85c for 2000 lb. c.l.; carload packed differential .45c; f.o.b. shipping point, freight allowed. Prices per lb. contained Cr high nitrogen, low carbon ferrochrome: Add 2c to low carbon ferrochrome prices; all zones. For higher nitrogen carbon add 2c for each .25% of nitrogen over 0.75%.

Special Foundry ferrochrome: (Chrom. 62-66%, car. approx. 5-7%) Contract, carload, bulk 13.50c, packed 13.95c, ton lots 14.40c, less, 14.90c, eastern, freight allowed, per pound contained chromium; 13.90c, 14.35c, 15.05c and 15.55c central; 14.50c, 14.95c, 16.25c and 16.75c, western; spot up .25c.

S M. Ferrochrome, high carbon: (Chrom. 60-65%, sil. 4-6%, mang. 4-6% and carbon 4-6%.) Contract, carlot, bulk, 14.00c, packed 14.45c, ton lots 14.90c, less 15.40c, eastern, freight allowed; 14.40c, 14.85c, 15.55c and 16.05c, central; 15.00c, 15.45c, 16.75c and 17.25c, western; spot up .25c; per pound contained chromium.

S M. Ferrochrome, low carbon: (Chrom. 62-66%, sil. 4-6%, mang. 4-6% and carbon 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium, 20.40c, 20.85c, 21.65c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up .25c.

SMZ Alloy: (Silicon 60-65%, Mang. 5-7%, zir. 5-7% and iron approx. 20%) per lb. of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c central zone; 14.05c, 14.60c and 15.10c, western; spot up .25c.

Silcaz Alloy: (Sil. 35-40%, cal. 9-11%, alum. 6-8%, zir. 3-5%, tit. 9-11% and boron 0.55-0.75%), per lb. of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed; 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up .25c.

Silvaz Alloy: (Sil. 35-40%, van. 9-11%, alum. 5-7%, zir. 5-7%, tit. 9-11% and boron 0.55-0.75%), per lb. of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern, freight allowed; 58.50c 59.75c and 60 75c, central; 60.50c, 61.90c and 62.90c, western; spot up ¼c.

CMSZ Alloy 4: (Chr. 45-49%, mang. 4-6%, sil. 18-21%, zir. 1.25-1.75%, and car. 3.00-4.50%). Contract, carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up .25c.

CMSZ Alloy 5: (Chr. 50-56%, mang. 4-6%, sil. 13.50-16.00%, zir. .75-1.25%, car. 3.50-5.00%) per lb. of alloy. Contract, carlots, bulk, 10.75, packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c and 12.50c, central; 13.25c and 13.75c, 14.50c and 15.00c, western, spot up .25c.

Ferro-Boron: (Bor. 17.50% min., sil. 1.50% max., alum. 0.50% max. and car. 0.50% max.) per lb. of alloy contract ton lots, $1.20, less ton lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Manganese-Boron: (Mang. 75% approx., boron 15-20%, iron 5% max., sil. 1.50% max. and carbon 3% max.), per lb. of alloy. Contract, ton lots, $1.89, less, $2.01, eastern, freight allowed; $1.903 and $2.023 central, $1.935 and $2.055 western, spot up 5c.

Nickel-Boron: (Bor. 15-18%, alum. 1% max., sil. 1.50% max., car. 0.50% max., iron 3% max., nickel, balance), per lb. of alloy. Contract, 5 tons or more, $1.90, 1 ton to 8 tons, $2.00, less than ton $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Chromium-Copper: (Chrom. 8-11%, cu. 88-90%, iron 1% max. sil. 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Vanadium Oxide: (Fused: Vanalium oxide 85-88%, sodium oxide approx. 10% and calcium oxide approx. 2%, or Red Cake; Vanadium oxide 85% approx., sodium oxide, approx. 9% and water approx.

2.5%) Contract, any quantity, $1.10 eastern, freight allowed per pound vanadium oxide contained; contract carlots, $1.105, less carlots, $1.108, central; $1.118 and $1.133, western; spot add 5c to contracts in all cases.

Calcium metal; cast: Contract ton lots or more $1.80, less, $2.30, eastern zone, freight allowed, per pound of metal; $1.809 and $2.309 Central, $1.849 and $2.349, western; spot up 5c.

Calcium-Manganese-Silicon: (Cal. 16-20% mang. 14-18% and sil. 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up .25c.

Calcium-Silicon: (Cal. 30-35%, sil. 60-65% and iron 3.00% max.), per lb. of alloy. Contract, carlot, lump 18.00c, ton lots 14.50c, less 15.50c, eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western; spot up .25c.

Briquets, Ferromanganese: (Weight approx. 3 lbs. and containing exactly 2 lbs. mang.) per lb. of briquets. Contract, carlots, bulk .0605c, packed .063c, tons .0655c, less .068c eastern freight allowed; .063c, .0655c, .0755c and .078c, central; .066, .0685c, .0855c and .088c, western; spot up .25c.

Briquets: Ferrochrome, containing exactly 2 lb. cr., eastern zone, bulk, c.l., 8.25c per lb. of briquets, 2000 lb. to c.l., 8.75c; central, add .3c for c.l. and .5c for 2000 lb. to c.l.; western, add .70c for c.l., and .2c for 2000 lb. to c.l.; **silicomanganese,** eastern, containing exactly 2 lb. manganese and approx. ½ lb. silicon, bulk, c.l., 5.80c, 2000 lbs. to c.l., 6.30c; central, add .25c for c.l. and 1c for 2000 lb. to c.l.; western, add .5c for c.l., and 2c for 2000 lb. to c.l.; **ferrosilicon,** eastern, approx. 5 lb., containing exactly 2 lb. silicon, or weighing approx. 2½ lb. and containing exactly 1 lb. of silicon, bulk, c.l., 3.35c, 2000 lb. to c.l., 3.80c; central, add 1.50c for c.l., and .40c for 2000 lb. to c.l.; western, add 3.0c for c.l. and .45c for 2000 to c.l.; f.o.b. shipping point, freight allowed.

Ferromolybdenum: 55-75% per lb. contained molybdenum f.o.b. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% phosphorus content, with unitage of $3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Eastern zone, 90-95%, bulk, c.l., 11.05c, 2000 lb. to c.l., 12.30c; 80-90%, bulk c.l., 8.90c, 2000 lb. to c.l., 9.95c; 75%, bulk, c.l., 8.05c, 2000 lb. to c.l., 9.05c; 50%, bulk c.l., 6.65c and 2000 lb. to c.l., 7.85c; central 90-95%, bulk, c.l., 11.20c, 2000 lb. to c.l., 12.80c; 80-90%, bulk, c.l., 9.05c, 2000 to c.l., 10.45c; 75%, bulk, c.l., 8.20c, 2000 lb. to c.l., 9.65c; 50% bulk, c.l., 7.10c, 2000 lb. to c.l., 9.70c; western, 90-95%, bulk, c.l., 11.65c, 2000 lb. to c.l., 15.60c; 80-90%, bulk, c.l., 9.55c, 2000 lb. to c.l., 13.50c; 75%, bulk, c.l., 8.75c, 2000 to c.l., 13.10c; 50%, bulk, c.l., 7.25c, 2000 to c.l., 8.75c; f.o.b. shipping point, freight allowed. Prices per lb. contained silicon.

Silicon Metal: Min. 97% silicon and max. 1% iron, eastern zone, bulk, c.l., 12.90c, 2000 lb. to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% silicon and max. 2% iron, eastern, bulk, c.l., 12.50c, 2000 lb. to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c f.o.b. shipping point, freight allowed. Price per lb. contained silicon.

Manganese Metal: (96 to 98% manganese, max. 2% iron), per lb. of metal, eastern zone, bulk, c.l., 36c 2000 lb. to c.l., 38c, central, 36.25c, and 39c; western 36.55c and 41.05c; 95 to 97% manganese, max. 2.50% iron, eastern, bulk, c.l., 34c; 2000 to c.l., 35c; central 34.25c and 36c; western, 34.55c and 36.05c; f.o.b. shipping point, freight allowed.

Ferrotungsten: Spot, carlots, per lb. contained tungsten, $1.90; freight allowed as far west as St. Louis.

Tungsten Metal Powder: spot, not less than 97 per cent, $2.50-$2.60; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb. contained titanium; ton lots $1.23; less-ton lots $1.25; eastern. Spot up 5 cents per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb. contained titanium; ton lots $1.35; less-ton lots $1.40 eastern. Spot 5 cents per lb. higher.

High-Carbon Ferrotitanium: 15-20% contract basis, per gross ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi River and North of Baltimore and St. Louis, 6-8% carbon $142.50; 3-5% carbon $157.50.

Carbortam: Boron 0.90 to 1.15% net ton to carload, 8c lb. f.o.b. Suspension Bridge, N. Y., frt. allowed same as high-carbon ferrotitanium.

Bortam: Boron 1.5-1.9%, ton lots 45c lb., less ton lots 50c lb.

Ferrovanadium: 35-55%, contract basis, per lb. contained vanadium, f.o.b. producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Zirconium Alloys: 12-15%, per lb. of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot ¼c per ton higher.

Zirconium Alloy: 35-40%, Eastern, contract basis, carloads in bulk or package, per lb. of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot ¼ cent higher.

Alsifer: (Approx. 20% aluminum, 40% silicon, 40% iron) contract basis f.o.b. Niagara Falls, N. Y., per lb. 5.75c; ton lots 6.50c. Spot ½ cent higher.

Simanal: (Approx. 20% each Si., Mn., Al.) Contract, frt. all. not over St. Louis rate, per lb. alloy; carlots 8c; ton lots 8.75c; less ton lots 9.25c.

Borosil: 3 to 4% boron, 40 to 45% Si., $6.25 lb. cont. Bo., f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. For complete OPA ceiling price schedule refer to page 150 of Sept. 4, 1944, issue of STEEL. Quotations are on gross tons.

PHILADELPHIA:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	16.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21.25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19.75
Heavy Turnings	18.25

Cast Grades

(F.o.b. Shipping Point)

Heavy Breakable Cast	16.50
Charging Box Cast	19.00
Cupola Cast	20.00
Unstripped Motor Blocks	17.50
Malleable	22.00
Chemical Borings	16.51

NEW YORK:

(Dealers' buying prices.)

No. 1 Heavy Melt. Steel	$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	20.00
Charging Box	19.00
Heavy Breakable	16.50
Unstrip Motor Blocks	17.50
Stove Plate	19.00

CLEVELAND:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
No. 1 Busheling	19.50
Mach. Shop Turnings	14.00
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec. Furnace Bundles	20.50

BOSTON:

(F.o.b. shipping points)

No. 1 Heavy Melt. Steel	14.06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Busheling	14.06
Machine Shop Turnings	9.06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13.81
Low Phos. Clippings	16.56
No. 1 Cast	20.00
Clean Auto Cast	20.00
Stove Plate	19.00
Heavy Breakable Cast	16.50

Boston Differential 99 cents higher, steel-making grades; Providence $1.09 higher.

PITTSBURGH:

(Delivered consumer's plant)

Railroad Heavy Melting	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp Bundles	20.00
Short Shovel Turnings	17.00
Mach. Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00

VALLEY:

(Delivered consumer's plant)

No. 1 R.R. Hvy. Melt.	$21.00
No. 1 Heavy Melt Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD, O.:

(Delivered consumer's plant)

Machine Shop Turnings	15.00

BIRMINGHAM:

(Delivered consumer's plant)

Billet Forge Crops	$22.00
Structural, Plate Scrap	19.00
Scrap Rails Random	18.50
Rerolling Rails	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	20.00
Stove Plate	19.00
Long Turnings	8.50- 9.00
Cast Iron Borings	8.50- 9.00
Iron Car Wheels	16.50-17.00

CHICAGO:

(Delivered consumer's plant)

No. 1 R.R. Hvy. Melt	$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dlr. Bundles	18.75
Baled Mach. Shop Turn.	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn.	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22.25
Cut Rails, 18-inch	23.50
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	20.00
R.R. Malleable	22.00

(Cast grades f.o.b. shipping point, railroad grades f.o.b. tracks)

BUFFALO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Busheling	19.25
Machine Turnings	14.00-14.25
Short Shovel Turnings	16.00-16.25
Mixed Borings, Turn.	14.00-14.25
Cast Iron Borings	15.00-15.25
Low Phos.	21.75

DETROIT:

(Dealers' buying prices)

Heavy Melting Steel	$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	10.50-11.00
Short Shovel. Turnings	11.50-12.00
Cast Iron Borings	10.50-11.00
Low Phos Plate	19.32-19.82
No. 1 Cast	20.00
Heavy Breakable Cast	16.50

ST. LOUIS:

(Delivered consumer's plant)

Heavy Melting	$17.50
No. 1 Locomotive Tires	20.00
Misc. Rails	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	12.22
Shoveling Turnings	11.00
Rerolling Rails	21.00
Steel Car Axles	21.50-22.00
Steel Rails, 3 ft.	21.50
Steel Angle Bars	21.00
Cast Iron Wheels	20.00
No. 1 Machinery Cast	20.00
Railroad Malleable	22.00
Breakable Cast	16.50
Stove Plate	19.00
Grate Bars	15.25
Brake Shoes	15.25
(Cast grades f.o.b. shipping point)	
Stove Plate	18.00

CINCINNATI:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.50
No. 2 Heavy Melt. Steel	18.50
No. 1 Comp. Bundles	18.50
No. 2 Comp. Bundles	18.50
Machine Turnings	8.50- 9.00
Shoveling Turnings	10.50-11.00
Cast Iron Borings	10.00-11.00
Mixed Borings, Turnings	9.50-10.00
No. 1 Cupola Cast	20.00
Breakable Cast	16.50
Low Phosphorus	21.00-21.50
Scrap Rails	20.50-21.00
Stove Plate	16.00-16.50

LOS ANGELES:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Deal. Bundles	12.00
Machine Turnings	4.50
Mixed Porings Turnings	4.00
No. 1 Cast	20.00

SAN FRANCISCO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$15.50
No. 2 Heavy Melt. Steel	14.50
No. 1 Busheling	15.50
No. 1, No. 2 Bundles	13.50
No. 3 Bundles	9.00
Machine Turnings	6.90
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Cast Steel	15.50
Cut Structural, Plate, 1", under	18.00
Alloy-free Turnings	7.50
Tin Can Bundles	14.50
No. 2 Steel Wheels	16.00
Iron, Steel Axles	23.00
No. 2 Cast Steel	15.00
Uncut Frogs, Switches	16.00
Scrap Rails	16.00
Locomotive Tires	16.00

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NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 12.00c, Del. Conn., less carlots 12.12½c, refinery; dealers may add ¾c for 5000 lbs. to carload; 1000-4999 lbs. 1c; 500-999 1½c; 0-499 2c. Casting, 11.75c, refinery for 20,000 lbs., or more, 12.00c less than 20,000 lbs.

Brass Ingot: Carlot prices, including 25 cents per hundred freight allowance; add ¼c for less than 20 tons; 85-5-5-5 (No. 115) 13.00c; 88-10-2 (No. 215) 16.50c; 80-10-10 (No. 305) 15.75c; Navy G (No. 225) 16.75c; Navy M (No. 245) 14.75c; No. 1 yellow (No. 405) 10.00c; manganese bronze (No. 420) 12.75c.

Zinc: Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, E. St. Louis, for carlots. For 20,000 lbs. to carlots add 0.15c; 10,000-20,000 0.25c; 2000-10,000 0.40c; under 2000 0.50c.

Lead: Common 6.35c, chemical, 6.40c, corroding, 6.45c, E. St. Louis for carloads; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland-Akron-Detroit area, New Jersey New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston-Worcester, Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lbs. and over; add ½c 2000-9999 lbs.; 1c less through 2000 lbs.

Secondary Aluminum: All grades 12.50c per lb. except as follows: Low-grade piston alloy (No. 122 type) 10.50c; No. 12 foundry alloy (No. 2 grade) 10.50c; chemical warfare service ingot (92½% plus) 10.00c; steel deoxidizers in notch bars, granulated or shot, Grade 1 (95-97½%) 11.00c, Grade 2 (92-95%) 9.50c to 9.75c, Grade 3 (90-92%) 8.50c to 8.75c, Grade 4 (85-90%) 7.50c to 8.00c; any other ingot containing over 1% iron, except PM 754 and hardness, 12.00c. Above prices for 30,000 lb. or more; add ¼c 10,000-30,000 lb.; ½c 1000-10,000 lbs.; 1c less than 1000 lbs. Prices include freight at carload rate up to 75 cents per hundred.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lbs.), 20.50c lb., add 1c for special shapes and sizes. Alloy ingots, incendiary bomb alloy, 23.40c; 50-50 magnesium-aluminum, 23.75c; ASTM B93-41T, Nos. 2, 3, 4, 12, 13, 14, 17, 23.00c; Nos. 4X, 11, 13X, 17X, 25.00c; ASTM B-107-41T, or B-90-41T, No. 8X, 23.00c; No. 18, 23.50c; No. 18X, 25.00c. Selected magnesium crystals, crowns, and muffs, including all packing screening, barrelling, handling, and other preparation charges, 23.50c. Prices for 100 lbs. or more; for 25-100 lbs., add 10c; for less than 25 lbs., 20c. Incendiary bomb alloy, f.o.b. plant, any quantity; carload freight allowed all other alloys for 500 lbs. or more.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lbs., 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05 per cent maximum arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

Antimony: American, bulk carlots f.o.b. Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05%, max. and other impurities, 0.1%, max.) 15.00c. On producers' sales add ¼c for less than carload to 10,000 lb.; ½c for 9999-224-lb.; and 2c for 223 lb. and less; on sales by dealers, distributors and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, f.o.b. refinery 35.00c lb.; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c; Monel shot 28.00c.

Mercury: OPA ceiling prices per 76-lb. flask f.o.b. point of shipment or entry. Domestic produced in Calif., Oreg., Wash., Idaho, Nev., Ariz., $191; produced in Texas, Ark. $193. Foreign, produced in Mexico, duty paid, $193. Open market, spot, New York, nominal for 50 to 100 flasks; $158 to $163 in smaller quantities.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be., $17 lb. contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks and all other "regular" straight or flat forms 90.00c lb., del.; anodes, balls, discs and all other special or patented shapes 95.00c lb. del.

Cobalt: 97-99%, $1.50 lb. for 550 lb. (bbl.); $1.52 lb. for 100 lb. (case); $1.57 lb. under 100 lb.

Indium: 99.9%, $7.50 per troy ounce.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, N. Y. 44.75c per ounce.

Platinum: $35 per ounce.

Iridium: $165 per troy ounce.

Palladium: $24 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 12.00c, Conn., for copper. Freight prepaid on 100 lbs. or more.)

Sheet: Copper 20.87c; yellow brass 19.48c; commercial bronze, 90% 21.07c, 95% 21.28c; red brass, 80% 20.15c, 85% 20.36c; phosphor bronze, Grades A and B 5% 36.25c; Everdur, Herculoy, Duronze or equiv. 26.00c; naval brass 24.50c; manganese bronze 28.00c; Muntz metal 22.75c; nickel silver 5% 26.50c.

Rods: Copper, hot-rolled 17.37c, cold-rolled 18.37c; yellow brass 15.01c; commercial bronze 90% 21.32c, 95% 21.53c; red brass 80% 20.40c, 85% 20.61c; phosphor bronze Grade A, B 5% 36.50c; Everdur, Herculoy, Duronze or equiv. 25.50c; Naval brass 19.12c; manganese bronze 22.50c; Muntz metal 18.87c; nickel silver 5% 26.50c.

Seamless Tubing: Copper 21.37c; yellow brass 22.23c; commercial bronze 90% 23.47c; red brass 80% 22.80c, 85% 23.01c.

Extruded Shapes: Copper 20.87c; architectural bronze 19.12c; manganese bronze 24.00c; Muntz metal 20.12c; Naval brass 20.37c.

Angles and Channels: Yellow brass 27.98c; commercial bronze 90% 29.57c, 95% 29.78c; red brass 80% 28.65c, 85% 28.86c.

Copper Wire: Soft, f.o.b. Eastern mills, carlots 15.37½c, less-carlots 15.87½c; weatherproof, f.o.b. Eastern mills, carlot 17.00c, less-carlots 17.50c; magnet, delivered, carlots 17.50c, 15,000 lbs. or more 17.75c, less carlots 18.25c.

Aluminum Sheets and Circles: 2s and 3s, flat mill finish, base 30,000 lbs. or more; del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers; full sheets 9.50c; cut sheets 9.75c; pipe 8.15c, New York; 8.25c, Philadelphia, Baltimore, Rochester and Buffalo; 8.75c, Chicago, Cleveland, Worcester, Boston.

Zinc Products: Sheet f.o.b. mill, 13.15c; 36,000 lbs. and over deduct 7%. Ribbon and strip 12.25c, 3000-lb. lots deduct 1%, 6000 lbs. 2%, 9000 lbs. 3%, 18,000 lbs. 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lbs. 12.50c; 100-500 lbs. 13.00c; under 100 lbs. 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

Plating Materials

Chromic Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lbs. to 1 ton 17.75c; under 400 lbs. 18.25c.

Copper Anodes: Base 2000-5000 lbs., del.; oval 17.62c; untrimmed 18.12c; electro-deposited 17.37c.

Copper Carbonate: 52-54% metallic cu, 250 lb. barrels 20.50c.

Copper Cyanide: 70-71% cu, 100-lb. kegs or bbls. 34.00c f.o.b. Niagara Falls.

Sodium Cyanide: 96%, 200-lb. drums 18.00c, 10,000-lb. lots 13.00c f.o.b. Niagara Falls.

Nickel Anodes: 500-2999 lb. lots; cast and rolled carbonized 47.00c; rolled, depolarized 48.00c.

Nickel Chloride: 100-lb. kegs or 275-lb. bbls. 18.00c lb., del.

Tin Anodes: 1000 lbs. and over 58.50c, del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

Tin Crystals: 400 lb. bbls. 39.00c f.o.b. Grasselli, N. J.; 100-lb. kegs 39.50c.

Sodium Stannate: 100 or 300-lb. drums 36.50c, del.; ton lots 33.50c.

Zinc Cyanide: 100-lb. kegs or bbls. 33.00c f.o.b. Niagara Falls.

Brass Mill Allowances: Prices for less than 15,000 lbs. f.o.b. shipping point. Add ¾c for 15,000-40,000 lbs.; 1c for 40,000 lbs. or more.

Scrap Metals

	Clean Heavy	Rod Ends	Clean Turnings
Copper	10.250	10.250	9.500
Tinned Copper	9.625	9.625	9.375
Yellow Brass	8.625	8.375	7.875
Commercial bronze 90%	9.375	9.125	8.625
95%	9.500	9.250	8.750
Red Brass, 85%	9.125	8.875	8.375
Red Brass, 80%	9.125	8.875	8.375
Muntz metal	8.000	7.750	7.250
Nickel Sil, 5%	9.250	9.000	4.625
Phos. br., A, B, 5%	11.000	10.750	9.750
Herculoy, Everdur or equivalent	10.250	10.000	9.250
Naval brass	*8.250	8.000	7.500
Mang. bronze	8.250	3.000	7.500

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are f.o.b. shipping point; add ¾c for shipment of 60,000 lbs. of one group and ½c for 20,000 lbs. of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper, copper borings 9.75c; No. 2 copper wire and mixed heavy copper, copper tuyeres 8.75c.

(Group 2) soft red brass and borings, aluminum bronze 9.00c; copper-nickel and borings 9.25c; car boxes, cocks and faucets 7.75c; bell metal 15.50c; babbit-lined brass bushings 13.00c.

(Group 3) zincy bronze borings, Admiralty condenser tubes, brass pipe 7.50c; Muntz metal condenser tubes 7.00c; yellow brass 6.25c; manganese bronze (lead 0.00%-0.40%) 7.25c, (lead 0.41%-1.0%) 6.25c; manganese bronze borings (lead 0.00-0.40%) 6.50c, (lead 0.41-1.00%) 5.50c.

Aluminum Scrap: Prices f.o.b. point of shipment, truckloads of 5000 pounds or over; Segregated solids, 2S, 3S, 5c lb., 11, 14, etc., 4 to 3.50c lb. All other high-grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb. borings and turnings one cent less than segregated.

Lead Scrap: Prices f.o.b. point of shipment. For soft and hard lead, including cable lead, deduct 0.55c from basing point prices for refined metal.

Zinc Scrap: New clippings 7.25c, old zinc 5.25c f.o.b. point of shipment; add ½-cent for 10,000 lbs. or more. New die-cast scrap, radiator grilles 4.95c, add ½c 20,000 or more. Unsweated zinc dross, die cast slab 5.80c any quantity.

Nickel, Monel Scrap: Prices f.o.b. point of shipment; add ½c for 2000 lbs. or more of nickel or cupro-nickel shipped at one time and 20,000 lbs. or more of Monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ½% copper 26.00c; 90-98% nickel, 26.00c per lb. nickel contained.

Cupro-nickel: 90% or more combined nickel and copper 26.00c per lb. contained nickel, plus 8.00c per lb. contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.00c; soldered sheet 18.00c.

Sheets, Strip . . .

Sheet & Strip Prices, Page 192

No easing is apparent in the tight sheet and strip situation, cancellations having had little effect on nearby deliveries. Mills are booked full to the end of the year and beyond, hot-rolled pickled being quoted for April in some instances. The situation is as congested as in plates in 1942 and no relief is in sight. War requirements still are heavy for use in the Pacific war, where climatic conditions dictate steel containers for much materiel.

New York — New business continues to ease somewhat. There is still good demand for unrated tonnage but difficulty in obtaining assurance as to delivery is discouraging consumers. Consequently there is not as much of this demand as a few weeks ago. Pressure continues, though, for over-runs and tonnage made available through cancellations where processing has been completed or partially completed, as this can be obtained ex-allotment and with assurance as to delivery.

Most leading sellers are booked well into next year on hot-rolled pickled sheets, some quoting April and beyond. On the other hand, certain producers can specify shipment in November and December on plain hot-rolled and also for cold-rolled sheets, although some sellers are booked well into next year on both of these latter products. Galvanized sheets for consumer account are difficult to obtain much before next March.

There is far above normal demand for polished stainless steel sheets, as reflected by the fact that certain producers are quoting polished material for delivery several months beyond unpolished stainless steel. For instance, one seller is quoting late October and November on unpolished stainless and late in second quarter of next year on polished stainless. Electrical sheets are in strong demand, with deliveries running around March and April in several instances and regardless of the amount of silicon. This reflects continued heavy demand for radar equipment, fractional horsepower motors, and similar uses.

Pittsburgh — Delivery on galvanized and other sheet items is currently as tight as was the case for plates during 1942. Some of the present larger war requirements in sheets are for ammunition containers and for drums and pails. Because of climatic conditions in the Pacific, ammunition requires special protection. Drums and pails are required for similar reasons, the air force, for instance, needs more of them for packing aircraft components. The Quartermaster Corps has recently issued a special requirements of 160,000 five-gallon drums per month for the next six months for packing liquid DDT and other insecticides. Request for 42,000 tons of additional sheet steel for production of steel drums by members of the Steel Shipping Container Advisory Committee was denied by WPB, due to the critical supply. The overall situation with regard to steel drums is now being reviewed by a WPB task committee with the view of determining fourth quarter requirements.

The metal strapping industry has been allocated 129,000 tons of carbon steel, the largest tonnage ever given the industry and reflects the growing demand for packaging war materiel in this manner to conserve lumber and paperboard, shipping space and saving in manpower in loading and unloading supplies.

Chicago—Despite the fact that opinion is general that the sheet and strip situation has eased somewhat, chiefly because WPB has taken a hand in an attempt to bring order out of confusion, mills in this district virtually find no change in their position. Books are filled with rated tonnage for the balance of the year and into 1946, and cancellations are negligible. Many consumers, feeling that the Japanese war is near an end, are beginning to press mills for delivery commitments on unrated tonnage. Feeling of sheetmakers here is that the situation in this area is tighter than in any other section of the country, due probably to the fact that Chicago has diversified manufacturing and has been carrying an unusual portion of the war load, some of which is now being completed or cut back.

St. Louis — Increasing manpower shortage, in spite of layoffs in other heavy industries, continues to put sheet deliveries further behind. Sheet output is less than at any time since the war peak. Three DPC blast furnaces at Granite City Steel Co. works are down from lack of labor. More than 10,000 tons of rated sheets and strip are piled, awaiting finishing. Substantial new CMP sheet orders are reported. Many unrated orders have been received but not scheduled. Galvanized sheet deliveries have been extended four months in the past 30 days, light galvanized now being promised for June, 1945, and heavy in December. Hot-rolled sheets are promised for March, cold-rolled for April and tin mill products for February.

Cincinnati — The tight situation in sheets is unrelieved, and it may well be that sheets ultimately will prove the bottleneck in many items on reconversion. Backlogs on rated orders are extended. Schedules show some tonnage in December for cold-rolled, but on hot-rolled April is the earliest delivery now promised. Galvanized is available in December, long ternes in January. Meanwhile, reconversion tonnage continues to pile up, possibly enough to keep mills at capacity for a year.

Boston — Incoming rated volume of narrow cold-rolled strip is below shipments and the approximate current rate of cancellations. Slight inroads are being made toward backlog reductions, presaging some openings for unvalidated tonnage in late fourth quarter, although the total will depend on the ratio of new rated orders and cancellations during the balance of this quarter. Spot openings are few, readily filled, and include scattered lots of alloys with some mills. Cancellations thus far involve a relatively higher ratio of high-carbon for rifle clips, belt links and landing mat springs, narrowing the spread with low-carbon. Cancellations on sheets are light in this area, also new buying in the rated category. Inquiry for unvalidated tonnage has also slackened, attributed to coverage already made and better appreciation of forward position of mill schedules as to likelihood of delivery against this type of commitment.

Cleveland — Sheetmakers in this district continue loaded with orders, covering capacity for the remainder of the year, with heavy carryover from second quarter keeping schedules continuously behind. Cancellations continue but are light as far as current business is concerned, applying mainly to remote deliveries. Unrated orders continue to be received but are not scheduled, as rated orders fill entire capacity. Occasional orders are given preference rating and displace others to provide space for material in greater need.

Philadelphia — Sheet backlogs, in common with other steel products, are somewhat less extended. Some producers are booked well into next year on both hot and cold-rolled, while others now can promise plain hot-rolled sheets as early as October and November. One large seller recently quoting hot-rolled pickled sheets for March now can accept this grade for January. Various requests by consumers for suspensions of early deliveries, so as to bring inventories within limits set by WPB, have been rejected by mills as the tonnage already is being processed or on the point of being so. This has placed consumers in a difficult position, for if they were to cancel the tonnage outright they might not be able to get back on mill schedule for some time.

Birmingham — Sheet demand is active, practically no cancellations have been received and mill backlogs continue heavy for all grades, deliveries being well extended and showing little improvement from cutbacks.

Steel Bars . . .

Bar Prices, Page 192

Conditions in the steel bar market are tightening and this product now ranks next to sheets and strip in heavy demand. Most producers are well booked through the year and on some grades and sizes can promise no delivery short of next year. Increase in price of cold-finished bars, to compensate for the recent advance on hot-rolled, affords some relief to cold finishers, but elimination of some processing extras more than offsets the advantage.

Pittsburgh — The $2 increase in base prices for cold-finished bars, effective Aug. 6, will be more than offset by reductions in strain drawing and special treatment extras on furnace treated items. Most of these extras are required in military specifications on shipments for the shell and other war programs. However, the increase in base prices reinstates the normal spread between hot-rolled and cold-finished bars, which is particularly important at this time when the industry is in the midst of a partial reconversion to a competitive civilian goods economy. It is pointed out that practically all tonnage shipped on civilian goods orders do not require the special treatment extras necessary under military specifications. Cold-drawers state that the increase in base prices will compensate them in part for the increase of $2 on the mill price of hot-rolled carbon bars and $3 on wire rods, effective May 23. No price adjustment was made on alloy cold-finished bars, as the mill price on hot-rolled alloy bars was not increased in May.

Cold-drawers are booked into December and January on larger sizes, but openings in schedules are noted as early as late September on smaller items with some interests. Liquidation of rated orders has been orderly and on a moderate

scale in recent weeks, with cancellations not up to expectations. Bookings of unrated tonnage recently have not been as large as generally believed, with many customers hesitating to proceed at this time in placing orders on a large scale for civilian goods. However, the automotive industry is a major exception to this buying policy. No rated tonnage of any consequence has been scheduled yet, and on the basis of current cancellations little will be shipped until November.

Chicago — Barmakers, who have been in a fairly comfortable position, now report that new business and demand have pushed this product into a situation which is exceeded only by sheets and strip in criticalne.s. This applies particularly to carbon grades; alloys are tighter than in recent months but still are well below capacity. Bar demand is well distributed and the growing tightness cannot be attributed to any individual segments of industry. As to forging grade bars, drop forgers have backlogs ranging five to six months, mainly on rated orders.

New York — In spite of certain cutbacks and cancellations, most sellers of hot carbon bars are booked well toward the end of the year, and on hot-top quality well into 1946. Certain producers are quoting April and May on larger rounds of the latter grade. Deliveries on cold-drawn carbon bars, 2 inches and larger, fall in December and January, due in large measure to the rocket program. In general, however, shipments are not as extended, and certain nearby openings are affording some relief to consumers. Except in alloy bars, little unrated tonnage stands a chance of being delivered before late in the year.

St. Louis — Barmakers here are still 90 per cent or more on CMP tonnage. Few contracts have been canceled since mid-June and production is expected to steady until the war's end. Unrated orders are not being sought as mills hesitate to promise delivery. Greatest pressure is on all sizes of flat bars and large rounds, two inches and over. Merchant rounds can be promised for September and flats for December.

Boston—On most sizes and grades fabricated in this area bar deliveries are improving in carbon grades, while hot-rolled alloys are available in September, cold-drawn also showing slight improvement. Some unrated volume in the latter is being booked, but new buying is not recovering from cutbacks, notably with mills, although warehouses are fairly active. Normally a substantial ratio of bars required here are distributed by warehouses and the trend is toward a return to that practice. Textile machinery, miscellaneous equipment builders and forge shops maintain part of the wartime volume by increased civilian activity, but the void in small arms, marine hardware, chain and other war demand is not being filled. Some automobile tonnage is going to forge shops this quarter.

Philadelphia — Reflecting continued heavy shell requirements producers of hot-top quality steel are quoting well into next year, in some cases as late as April on sizes of 2 5/16-inch and over. On ordinary hot-rolled carbon bars producers quote November through January. Some spot openings appear earlier but they are filled promptly. Hot alloy bars are freely available in September, with even unrated tonnage not in sufficient volume to round out schedules.

Steel Plates . . .

Plate Prices, Page 193

Gradual decline in demand for plates continues, but cancellations have not affected current schedules greatly and few openings appear. Considerable demand will come out over several months for large car and locomotive orders currently being placed. Some unrated tonnage may be shipped during September and later this year.

New York—As sellers are in position to accept unrated tonnage, plate business here is holding up fairly well. Jobbers are still pressing for tonnage, particularly for ship construction and repairs. Incidentally, some new ferry boat construction is under way here and is contributing to demand. Most plate sellers are booked solidly into October, with some fairly well scheduled into November.

The Navy has placed 84,000 tons of plates for August rolling 50,000 tons to Geneva Steel Works, Geneva, Utah, 9000 tons to Fontana and the remainder to mills further east.

Pittsburgh — A downward trend in plate production schedules is indicated

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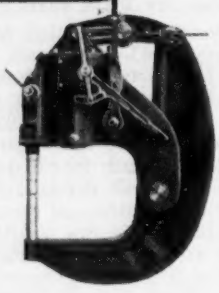

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through the remaining months this year, despite increasing demand for railroad freight cars and locomotives, and large new requirements for the Navy. Most of the latter tonnage, about 130,000 tons, has been scheduled on western mills for August delivery, and therefore will not directly affect mill schedules here. New orders for locomotives include 303 for the Army; however, slightly over half those on order for Russia have been canceled. Reduction in plate output in recent months has permitted rechanneling of a substantial quantity of raw steel into critically needed sheet and strip production. Producers expect to ship some unrated tonnage during September, for wide and narrow sheared plates are now available for September delivery and October shipment can be had on universal plates. Volume of inquiries for unrated tonnage has made a further increase in recent weeks, but not to the extent reported for sheets, bars and other steel products.

Chicago — Plate load on mills, while declining gradually month by month, develops few openings. Despite cancellations and cutbacks in war production, plate situation is little affected and rated tonnage occupies rolling schedules almost solidly for remainder of the year. One platemaker, who is producing a considerable volume of bomb plate, has been instructed by WPB to reduce its August output of this item approximately 4000 tons, but at the same time was asked that the opening be not filled pending further word.

St. Louis — Plate production in this district is down to 5000 to 6000 tons per month, with prospects it will go down to 4000 within 60 days. Demand has decreased to an extent that warehouses report deliveries best of all products. Delivery schedules are in November. Plate orders in this area are mainly for Maritime Commission ship repair needs.

Boston — What has happened to plate demand in New Englad is told in shipyard employment. From peak, 103,000 have been dropped from payrolls at eight major yards, including Navy establishments and those building combat vessels. Two are closing this month, Bethlehem-Hingham and Walsh-Kaiser, at Providence, R. I. This has directly affected many fabricating shops under subcontracts, although the impact on these developed some time ago. For September delivery, including unrated orders, buying is not brisk.

Birmingham — Plate mills are working at capacity, though much absenteeism holds back production to some extent. Most demand is for war essentials, though pressure is lighter than in preceding months.

Wire . . .

Wire Prices, Page 193

Boston — Prospects for delivery on most high-carbon fine wire specialties before late fourth quarter are fading, with volume of new unrated orders sustained at a higher rate than expected in many instances. Here and there openings appear for low carbon requiring a minimum of processing, for delivery earlier, but on the whole shipment of unrated this quarter will be under expectations. Patenting and annealing, heavily loaded, are choke points. There is some easing in the overall situation outside of specialties, including tire bead wire and some sizes of rope for stranding. Full advantage in signal wire cancellations is hampered by uncertainty as to delivery wanted on the balance, making for uncertainty as to filling space in these sizes. Oil-tempered wire continues tight and is generally in December. For valve spring wire pressure is from the automotive industry. Although cut back, material for precision mechanical springs is still mainly for war requirements, 85 per cent approximately, and no delivery is definite on unrated orders.

Buffalo — Little capacity is available for unrated wire business. Sellers report a comprehensive checkup reveals war work still commands practically all present output. One producer, however, managed to turn out a small tonnage of low carbon wire.

Tin Plate . . .

Tin Plate Prices, Page 193

Chicago — District tin plate production took a sharp drop late in July when several hundred workers in the tin mill of Inland Steel Co. struck July 22 and remained away from their jobs for a week. This work stoppage made a bad situation worse, for shortage of manpower already was preventing the company from meeting its recently increased production directive. District mills are booked solidly until year's end on tin plate. Box car supply fluctuates from week to week, but in the past month

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has not seriously held back shipments of finished plate to consumers.

Pittsburgh — The three new electrolytic lines at Carnegie-Illinois' Irvin works continue to operate above capacity, with July output probably exceeding the record established during June, when production averaged 114 per cent of capacity. At the Corporation's Gary, Ind., works, however, only one of the three electrolytic lines is in operation. Average rate of electrolytic production at U. S. Steel Corp.'s other plants is around 50 per cent of capacity. No specific program has developed that will make more pronounced the shift from hot-dipped tin plate to greater use of electrolytic. However, revision of order M-81 is under consideration, due to the immediate need to conserve pig tin supplies, and important changes in tin coating regulations governing certain type containers may be put into effect next quarter.

Mill tin plate shipments are still behind schedule, as a result of the moderate carryover tonnage, and it is improbable that the deficit can be made up this quarter. Although 1945 is not likely to be a spectacular year for crops, steady pressure for early shipment against third quarter schedules is noted from can manufacturers. Current signs point to a third quarter output of 933,000 tons of tin mill products, and little change is indicated for fourth quarter. Export shipments for the three months ending Sept. 30 will be the lowest for any quarter during the war.

Rails, Cars . . .

Track Material Prices, Page 193

New York — Domestic freight car inquiry continues to expand, with the Chicago & North Western now inquiring for 800 seventy-ton gondolas, and likely to be in the market soon for 1300 box cars. The Southern Pacific has increased its pending list from 1800 to 3550 freight cars, while the Louisville & Nashville is expected to step up its inquiry from 2000 to 3000. The Baltimore & Ohio may increase its present inquiry for 2000 to 4500.

Meanwhile, the Illinois Central has placed 1800 freight cars with its own shops, and the Clinchfield, 300 with Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., leaving 1050 yet to be reported as placed. Western Maryland has closed on 40 covered cement hopper cars to American Car & Foundry Co., New York, and the Chesapeake & Ohio, 30 passenger train cars to Edward G. Budd Mfg. Co., Philadelphia. Cincinnati has purchased 25 street cars from the St. Louis Car Co., St. Louis.

Actively pending at present, according to reliable trade estimates, are about 15,000 freight cars. In addition, close to 6700 domestic cars are under tentative contemplation. Also approximately 680 passenger cars are actively pending.

Domestic freight cars now being figured are largely for delivery in first half of next year, as orders already on schedule leave little material available for additional work this year.

Action is still suspended on 30,000 freight cars for France and 6000 for India. Various other lists are pending for export, including approximately 3500 cars in the aggregate for Chile, Bolivia and Mexico, and several hundred cars for Brazilian railroads, according to trade reports.

Featuring locomotive demand is award of 303 forty-two-gage 2-8-2 type locomotives, for the United States Army. Baldwin Locomotive Works, Philadelphia, has been awarded 181; American Locomotive Co., New York, 76; Davenport-Besler Corp., Davenport, Iowa, 46.

While 290 out of 500 locomotives for Russia have been recently canceled, American builders have substantial backlogs. They are working on 700 for France, with the order expected to be completed by the end of this year; 190 for the United Nations Relief & Rehabilitation Administration; also a number for Belgium and India.

As schedules now stand, American Locomotive has 100 for Russia, 40 for UNRRA, 260 for France, 80 for Belgium and 76 forty-two-gage for the United States Army; Baldwin, 110 for Russia, 260 for France, 181 forty-two-gage for United States Army and 60 locomotives for India; Lima Locomotive Works, Lima, O., 180 for France and 60 for UNRRA; and Davenport, 46 for United States Army.

Structural Shapes . . .

Structural Shape Prices, Page 193

Increased demand for structural shapes is adding to mill backlogs and delivery promises are being extended, now three

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to four months. Contractors are backward about figuring on projects as delivery is likely to be in cold weather when construction is difficult. However, an increasing number of contracts is being let. Some unrated tonnage may be available late in third quarter, under present conditions.

New York — Featuring structural awards are 1100 tons for a power plant for Consolidated Edison Co., Astoria, Long Island, and 1000 tons for a Dairymen's League building, Manhattan, both tonnages going to the Utica Structural Steel Co., Utica, N. Y. Other work includes 270 tons for a factory building for Congoleum Nairn Inc., Kearny, N. J., placed with the Katchen Iron Works, Newark, N. J., this being in addition to 265 tons noted recently as placed with Bethlehem Fabricators, Bethlehem, Pa., for another building for this company.

Chicago — Fabricators are being pressed to figure a multiplicity of small and medium-sized jobs. However, the majority are of postwar character, which, although having approval of WPB, will not be given benefit of priority assistance. Since fabricators cannot promise steel even if they become successful bidders, they are reticent to submit propositions. Engineering and estimating staffs are small and insufficient to handle work on other than the most attractive projects

Pittsburgh — There is little prospect of any substantial unrated tonnage being shipped until late this quarter, as mill order backlogs are extended into September and beyond. Structural mills have had little opportunity to increase production because raw steel made available from the steady decline in plate requirements has been absorbed by increased output of sheets, strip and other critical war steel needs. There is good prospect of considerable improvement in supply in some construction materials and components toward the close of this year. On the basis of this favorable outlook there has been a substantial increase in volume of inquiries for alterations and repairs for store buildings and small plant improvement. However, most of the immediate postwar construction involves bridges and highway work. Increase in railroad car construction over the remainder of this year is a major factor in the current structural outlook.

Buffalo — An increased volume of structural projects, many still in the drawing board stage, are creating new interest. Noted are a number of nonwar projects, probably inspired by gradual release of materials by WPB. Numerous bridges are included. The State Postwar Public Works Planning Commission has approved an additional $3,309,500 in county postwar projects. Ingalls Iron Works, Verona, Pa., has received a 2000-ton contract for a new building for the Harrison Radiator Division of General Motors Corp., Lockport, N. Y.

Philadelphia — Shape deliveries now are generally in November, on wide flange as well as standard sections. The new West Coast Navy program, involving 44,000 tons for August rolling, is reflected in this further tightening.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 193

St. Louis — Inquiries for reinforcing bars are increasing as building controls ease. Contracts for several structures are to be let soon, involving 2000 to 3000 tons. Delivery schedules on reinforcing bars, rated and unrated, are September and later.

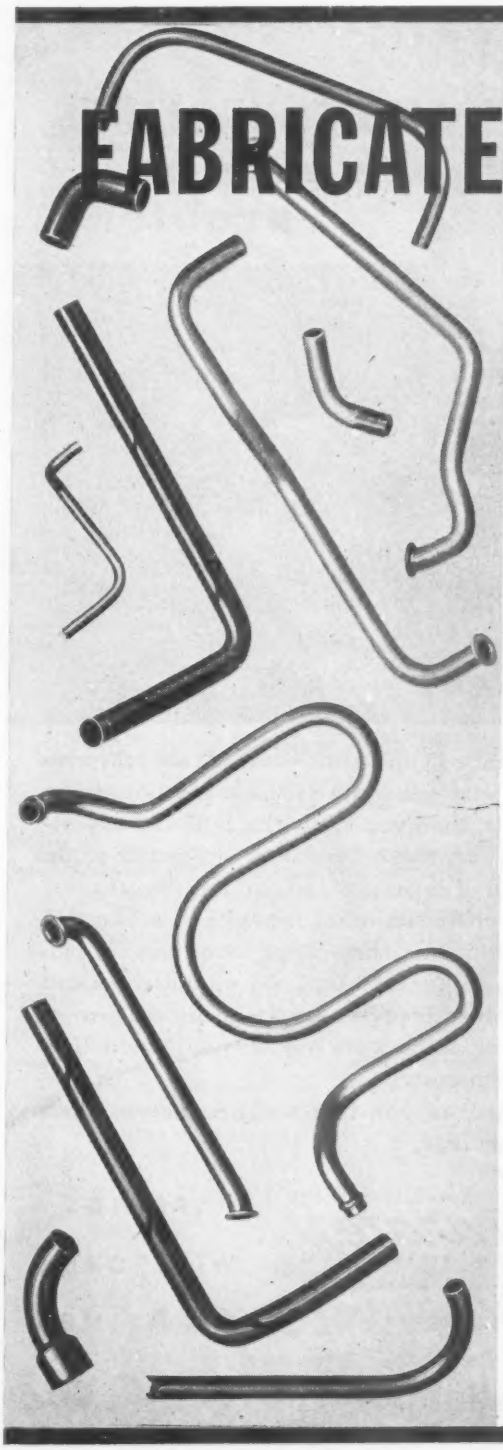
Chicago — Activity on reinforcing steel jobs ranging 100 tons and over is running light, no awards having come to light in the past week and only one new inquiry being current. The latter is a diagnostical hospital for U. S. Veterans Administration to be built in Elgin, Ill., with bids Aug. 8. A tonnage estimate is not yet available. Reinforcing suppliers are devoting most of their time to a multiplicity of small jobs involving little tonnage but requiring considerable engineering attention. Many of the jobs have WPB approval but must be handled without a priority on steel. Supply of steel being low and no immediate improvement in prospect, reinforcing interests attempt to be selective in what they take on.

Pig Iron . . .

Pig Iron Prices, Page 195

Conditions in the pig iron market are decidedly tight, although sufficient iron has been supplied melters to meet current needs. However, reserves are small and a slight increase in melt would cause distress. In some areas car shortage interferes with shipments. Export inquiries are receiving little attention because of limited supply.

Pittsburgh — Fact that some steel



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producers have been forced to get additional pig iron from outside sources and inadequate foundry scrap, have combined to increase the overall demand for merchant iron. However, the consumption of merchant iron during July showed a seasonal decline. Demand this month is expected to absorb all output. Production continues limited by manpower shortage and to a greater extent by low coking coal supply and strikes. Iron stocks at producing points and foundries are declining somewhat as consumption is currently slightly in excess of production.

New York — Warm weather and vacation influences are expected to maintain pig iron melt in this district at about the same level as for July, when operations were down somewhat from the preceding month. In view of stringency in iron, continued lull would prove welcome to most producers. Export inquiries are still coming out, but are receiving little consideration under the circumstances.

Buffalo—Shortage of scrap has further tightened the pig iron market as the two leading mill producers have all blast furnaces back on basic iron. One mill, in desperate need of scrap, turned its sixth blast unit to basic iron after a short period of merchant production. A big part of the latter was reported for shipment to New England consumers. Sellers are striving to get sufficient cars to meet pressing demands from other areas. Sellers attribute the recent car shortage to an increased number of open gondolas being diverted from iron to grain.

St. Louis — Pig iron remains tight with practically all production still under CMP. Lack of sufficient labor has caused banking of one of Koppers United's two blast furnaces, with no prospect of early resumption. Sellers have trouble meeting requirements and pressure is reported as great as at any time during the war. Little iron is available to civilian buyers. Manpower shortage is estimated at 10 per cent, slightly better than a week ago.

Philadelphia — Pig iron supply has been eased somewhat by resumption of a 1400-ton furnace at Bethlehem, Pa., after suspension of 30 days for repairs. Also contributing to better balance of supply and demand is somewhat lighter foundry melt, with likelihood that labor shortage, hot weather and vacations will continue to restrict production in August. But above all, manpower is the greatest limiting factor, with foundries generally complaining of lack of molders.

Chicago — Despite the fact that 39 foundries in Chicago and Fox River valley remain idle for the second consecutive week because of the strike of approximately 1500 workers, iron demand has not eased as much as might have been expected. This situation, plus shortage of men in operating shops constitute a definite hold-down on production of castings. But further deterioration in blast furnace activity and the effort of melters to build up inventories to the allowed 30-day level contribute to keep iron tight. Interlake Iron Corp. has blown out Federal "B" stack Aug. 1 for relining. The other five idle are undergoing relining, repairs or rebuilding.

Boston — Although pig iron supply is ample for current melt and 30-day inventory there is no margin and the strain on Buffalo district furnaces continues. Likelihood of increased tonnage from integrated furnaces in the near future is fading and resumption of blast by the district furnace is uncertain in view of the expected fuel pinch. More concern is expressed as to future requirements. Several large consumers, increasing reconversion schedules, continue handicapped by foundry labor shortage and are subcontracting extensively.

Scrap . . .

Scrap Prices, Page 196

Tightness continues in scrap, with many melters operating on small reserve and vainly seeking further supply. Prices are at ceiling and strong with springboard and all other extras being paid. Fears for supply for winter use are expressed. Lack of labor interferes with yard processing and loading.

Philadelphia — With one large eastern consumer exerting less pressure for tonnage the scrap market is slightly easier. However, prices still are firm and production of shipyard scrap and turnings is not as heavy. In certain grades, notably in low phos, demand appears heavier than in recent weeks, a situation emphasized by decline in production of plate scrap.

Pittsburgh — Flow of scrap to consumers in this district is well below normal. Scrap interests are becoming more concerned over adequacy of scrap supplies for late fall and winter. Scrap is increasingly difficult to get, with rail-

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3823 W. LAKE STREET CHICAGO 24, ILLINOIS

oad lists only a fraction of normal onnage, and production scrap steadily diminishing. Dealers and brokers are having difficulty filling contracts, with he former experiencing no relief from he manpower shortage. A few instances are reported of mills paying in excess of the $1 freight equalization on both heavy melting steel and turnings. All grades remain at ceiling.

Buffalo — Despite talk of war order cutbacks and cancellations, strength grows more pronounced in the scrap market. No new business of any consequence was placed during the week as dealers continued to ship against recently placed large orders. Dealers, however, demand ceiling prices for practically all items. Ceilings were asked for turnings following reports that Pittsburgh and Valley consumers were placing orders with midstate sellers at top prices plus full springboard. Bolstering dealers' sentiment and the market is the depleted stockpile of a top consumer, who is operating almost on a hand-to-mouth basis. Another boatload of 5000 tons has arrived from the Duluth area.

Cincinnati — Consumer interest in iron and steel scrap has been revived after what had all appearances of a pre-war, summer lull. One district mill, out of the market for many weeks, re-entered with a purchase of open-hearth scrap in a move to maintain its stockpiles. Strength in nearby districts on borings and turnings, combined with a slackening in local output, sent prices up 50 cents to $1. Some specialties, for which outlets were found scarce recently, are in better demand.

St. Louis — Scrap supply continues tight, lack of better grades pushing turnings and borings to their ceiling, with few takers at that level. Two large melters are easing out of the market, awaiting outcome of the war and, in one instance, a Defense Plant Corp. decision on three government-owned furnaces. These have been shut down, reducing the mill's scrap needs 50 per cent or more. Mill reserves are reported at about 30 days. Contract cutbacks have further slowed broker orders. Dealer shipments are slow, labor being short. No. 2 heavy melting steel is in greatest demand.

Chicago — Now that all grades of carbon scrap are back at ceiling prices interest of consumers centers in getting quantities desired. Factory material is declining, a reflection of war contract cutbacks, especially noticeable in borings and turnings. At the same time, dealers' yards are accumulating less and manpower scarcity holds back its processing. Country scrap fails to appear in dependable volume. Steel mill receipts are believed to be close to current melting requirements, with prospects that intake may drop off to threaten the balance. Insufficient hot metal, because of blast furnaces down for repairs, forces heavier scrap consumption.

Boston — Demand for scrap is strong at ceiling prices, including borings and turnings, with supply of shipyard and industrial scrap lower. Overall production of turnings is well under half what it was the first of the year. Demand for low phos and foundry grades is also strong and some consumers are building up reserves of cast where possible. Prices of unprepared scrap are lower.

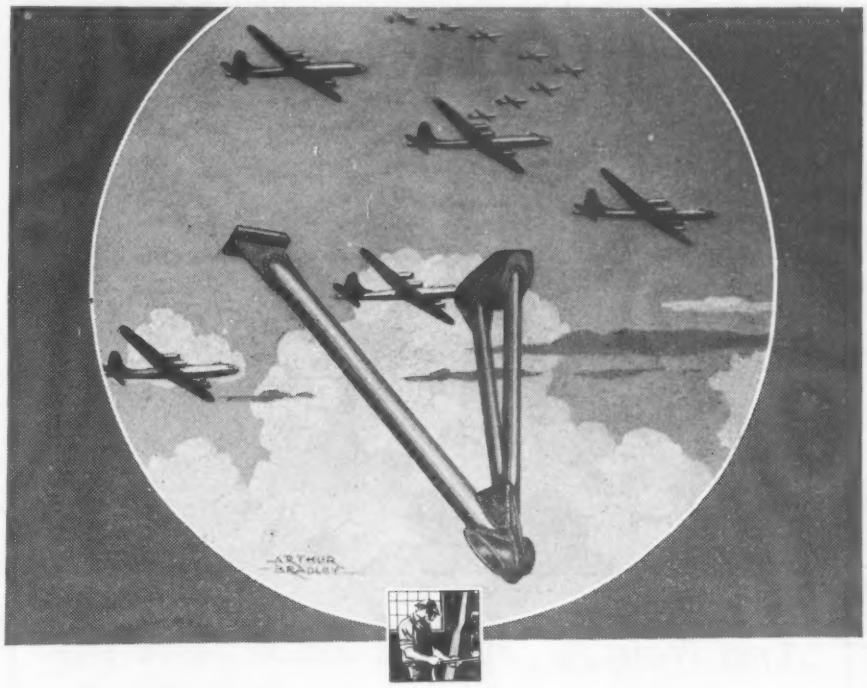
Cleveland — The situation in steel and iron scrap is tight and all prices are at ceiling. Melters are taking all material made available by dealers and all are having trouble obtaining as much as they need. Supply is relatively small and difficulty is met in preparing collections, because of short labor supply.

Luria Bros. To Open Scrap Plant at Toledo

Luria Bros. Co. Inc., large dealer in steel and iron scrap, is opening a wholesale scrap plant on the Maumee river at Toledo, O., it is announced by Jack Levand, Ohio district manager. Robert H. Clymer, Reading, Pa., vice president of yards and operations, announces the plant is planned to be ready for operation about Sept. 1 and the supervisory personnel will be named later.

The plant will handle incoming and outgoing boat scrap by its rail and water connections, dealing only in wholesale scrap. Modern equipment is being installed and the dock will have capacity for storage of 100,000 tons of scrap. This plant will serve all Ohio customers of the company.

The entire Office of Price Administration schedule of prices at Toledo is based on movement across this dock and the situation is such that freight rates and established prices make it competitive with Cleveland dealers. One reason for this move is that two large Cleveland consumers are making expan-



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WROUGHT IN STEEL!

Steel tubing—plus steel forgings—plus the "know-how" of precision manufacturing . . . equals vitally necessary parts for war planes for Uncle Sam and his Allies.

Here at Aircraft Mechanics, Inc., are fashioned thousands of forging and welded tubular structural units for assembly into the fighting, bombing and cargo carrying aircraft which play such an important role in the defeat of the enemies of Democracy.

Each of these units—symbols of victory wrought in steel—are precision manufactured. Tolerances often are in the tenths of thousandths. The skills to obtain such tolerances have been developed on our own production lines.

Now, our Army and Navy receive 100% of the production we produce. Tomorrow, this manufacturing "know-how" . . . our modern machinery and facilities . . . and our war tested man-power—can serve you.

Write us, today, for full particulars regarding our ability to produce quality goods within the time schedules most satisfactory to you.

BUY UNITED STATES WAR BONDS AND STAMPS

★ AIRCRAFT MECHANICS INC.
COLORADO SPRINGS, COLORADO

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sion plans that will enlarge scrap consumption there.

Luria Bros. Co. Inc. has 11 offices, the main office being at Reading, Pa. It operates eight plants, two in Pittsburgh and one each at Ecorse, Detroit; Donaghmore, Lebanon, Reading, Modena, Pa.; East Chicago, Ind. The Toledo plant will be the ninth plant. Other expansion plans are under consideration to enlarge service to the company's customers.

Canada . . .

Toronto, Ont. — While there has been some curtailment in buying in the Canadian steel market as a result of the holiday season, overall demand has not slackened. Inquiries continue in good volume with most associated with civilian requirements. There has been considerable tapering in demand on war account, while at the same time a number of large war orders have been canceled. Despite these conditions there has been no actual easing in supply as far as major items are concerned and on most new bookings producers are unable to give definite delivery promise.

Announcement has just been made by C. D. Howe, minister of munitions and supply, of lifting of steel control on distribution of steel from warehouses. The order just rescinded limited the amount of steel which any customer could purchase from warehouse for purposes other than war and highly essential civilian production, to ten tons of carbon steel and two tons of alloy steel during each calendar quarter.

Steel in Europe . . .

London — (*By Radio*) — Industry in Great Britain welcomes the five-year plan for modernization but the immediate outlook is uncertain. August business is restricted by the holiday season. Shortage of manpower continues to limit production.

Iron Ore . . .

Iron Ore Prices, Page 194

Lake Superior iron ore loaded at upper lakes ports in July totaled 11,372,282 gross tons, compared with 12,908,972 tons in July, 1944, according to records of the Lake Superior Iron Ore Association, Cleveland. Season shipments to Aug. 1 totaled 40,396,868 tons, against 42,285,902 tons to the same date last year. The new Canadian port at Port Arthur, Ont., put in service during the month to handle Steep Rock ore, loaded 13,978 tons. Decline in ore loadings is attributed to increased use of carriers for transporting grain from the head of the lakes.

As Aug. 1 is practically the middle of the season of navigation, indications are for movement of close to 80,000,000 tons for the season, compared with 81,170,538 tons transported in the full season in 1944.

Warehouse . . .

Warehouse Prices, Page 194

Pittsburgh — Shipments out of warehouse stock during July maintained the active pace of preceding months, with some interests reporting an increase of 5 per cent in sales. No lessening in warehouse steel demand is indicated over the next two months. However, when war contract cancellations begin to appear in heavy volume, much of the present demand on warehouse stock will return to normal mill sources. Further decline in distributors' stocks occurred during July, with sheet showing the largest decline. However, most items are in fairly good balance with current requirements.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, Harrison Radiator Division of General Motors Corp., Lockport, N. Y., to Ingalls Iron Works Co., Verona, Pa., John W. Cowper Co. Inc., Buffalo, general contractor.

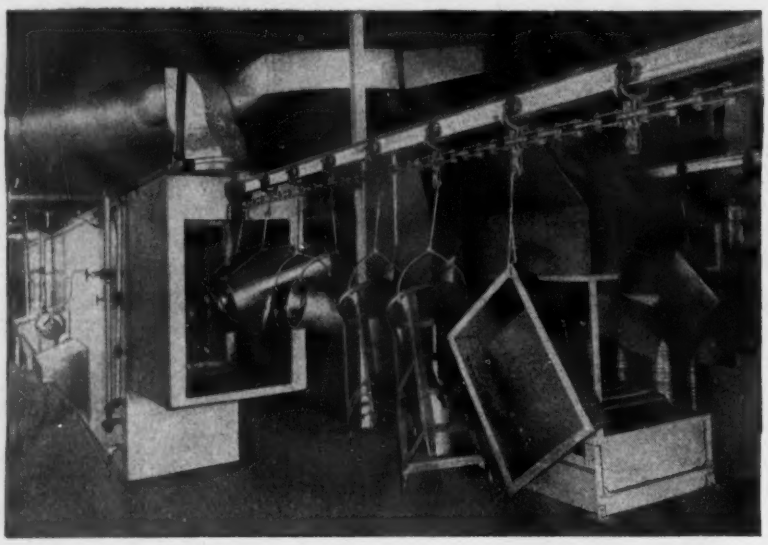
5200 tons, assembly plant, Robertson, Mo., for Ford Motor Co., to American Bridge Co., Pittsburgh; bids June 20.

1100 tons, extension to cellophane plant, Clinton, Iowa, for E. I. du Pont de Nemours & Co. Inc., to Clinton Bridge Works, Clinton, Iowa; bids June 20.

1100 tons, power plant, for Consolidated Edison Co., Astoria, Long Island, through the Kaye Construction Co., Brooklyn, general contractor, to the Utica Structural Steel Co., Utica, N. Y.

1000 tons, Dairymen's League building, Manhattan, New York, through Karl Koch, erector, New York, to Utica Structural Steel Co., Utica, N. Y.

960 tons, bridge requirements, various locations, for Atchison, Topeka & Santa Fe railroad, 780 tons to Bethlehem Steel Co., Bethlehem, Pa., 90 tons to American Bridge Co., Pittsburgh, and 90 tons to Joseph T.



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ECONOMIES loom on the horizon as you enter into civilian work . . . because it's money in your pocket to cut costs and speed production. Plus-costs mean minus-profits. Best way TO ECONOMIZE IS TO MODERNIZE your cleaning equipment.

Note the monorail cleaning machine to WASH . . . RINSE . . . DRY METAL PARTS BEFORE PAINTING OR OTHER OPERATIONS. Work is carried through machine suspended on hooks attached to chain conveyor.

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1317 TOWNSHIP AVE., CINCINNATI, OHIO

Ryerson & Son Inc., Chicago; bids July 10.

900 tons, addition, Link-Belt Co., Indianapolis, to Joseph T. Ryerson & Son Inc., Chicago; Carl M. Guepel, Indianapolis, contractor.

309 tons, bridges, 209 tons in Saline county, Mo., and 100 tons in Gentry county, Mo., for state highway commission, to Kansas City Structural Steel Co., Kansas City, Kans.; C. E. Maxwell & Son, Columbus, Kans., contractor; bids June 15.

350 tons, addition to Transite pipe building, Waukegan, Ill., for Johns-Manville, to American Bridge Co., Pittsburgh.

300 tons, manufacturing building, Columbia Pipe & Supply Co., Chicago, to American Bridge Co., Pittsburgh; Algot B. Larson, Chicago, contractor; bids June 4.

270 tons, factory building, Congoleum Nairn Inc., Kearny, N. J., through Turner Construction Co., to the Katchen Iron Works, Newark, N. J.; this is in addition to another building, involving 265 tons, recently noted as placed with Bethlehem Fabricators, Bethlehem, Pa.

200 tons, Cleveland Cliffs Iron Co., Ishpeming, Mich., to Worden-Allen Co., Milwaukee.

160 tons, Baltimore & Ohio freight terminal, Eleventh avenue and 24th Street, Manhattan, New York City, to Bethlehem Fabricators, Bethlehem, Pa.

STRUCTURAL STEEL PENDING

1600 tons, barrel racks for North American Warehouse Co., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa., through McCloskey & Co., Philadelphia.

1200 tons, warehouse and enameling building, American Stove Co., St. Louis; bids July 15.

1000 tons, beam and girder bridges, Cameron county, Tex., for state highway department.

800 tons, five factory buildings, C. B. Hill Co., Trenton, N. J.; bids Aug. 7.

450 tons, billet conditioning building, Alan Wood Steel Co., Conshohocken, Pa., to Belmont Iron Works, Philadelphia.

500 tons, parts building, Ford Motor Co., Denver; bids Aug. 2.

350 tons, factory building, American Coating Mills Inc., Elkhart, Ind.; bids June 19.

300 tons, factory building, F. L. Jacobs Co., Danville, Ill.

100 tons, crane runway, Philadelphia Navy yard.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, building, Bureau of Census, Suitland, Md., to Bethlehem Steel Co., Bethlehem, Pa., through Charles H. Tompkins, contractor.

800 tons, Mystic station, Boston Edison Co., Boston, to Bethlehem Steel Co., Bethlehem, Pa., through Thomas O'Connor, contractor.

145 tons, Harrison Radiator Division of General Motors Corp., Lockport, N. Y., to Truscon Steel Co., Buffalo.

REINFORCING BARS PENDING

450 tons, bulkhead, Norfolk & Western Railroad, Lamberts Point, Va.

400 tons, U. S. Veterans hospital, Rutland Heights, Mass.

250 tons, highway bridge, Arlington, Va.

150 tons, tunnel for General Electric Co., Syracuse, N. Y.

150 tons, state hospital, Byberry Grounds, Philadelphia.

PLATES . . .

PLATES PLACED

200 tons, Great Northern Railroad, St. Paul, to American Bridge Co., Pittsburgh.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chesapeake & Ohio, 30 passenger train cars, to Edward G Budd Mfg. Co., Philadelphia.

Cincinnati, 25 street cars, to St. Louis Car Co., St. Louis.

Clinchfield Railroad Co., 300 fifty-ton steel box cars, to Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill.; this leaves 1050 freight cars yet to be reported as placed.

Illinois Central, 1800 freight cars; to own shops.

Western Maryland, 40 seventy-ton covered cement hopper cars, to American Car & Foundry Co., New York.

RAILROAD CARS PENDING

Baltimore & Ohio, now inquiring for 2000, may increase its list to 4500, according to trade reports.

Chicago & Northwestern, 800 seventy-ton gondolas, bids asked; inquiry for 1300 box cars is expected to be issued momentarily.

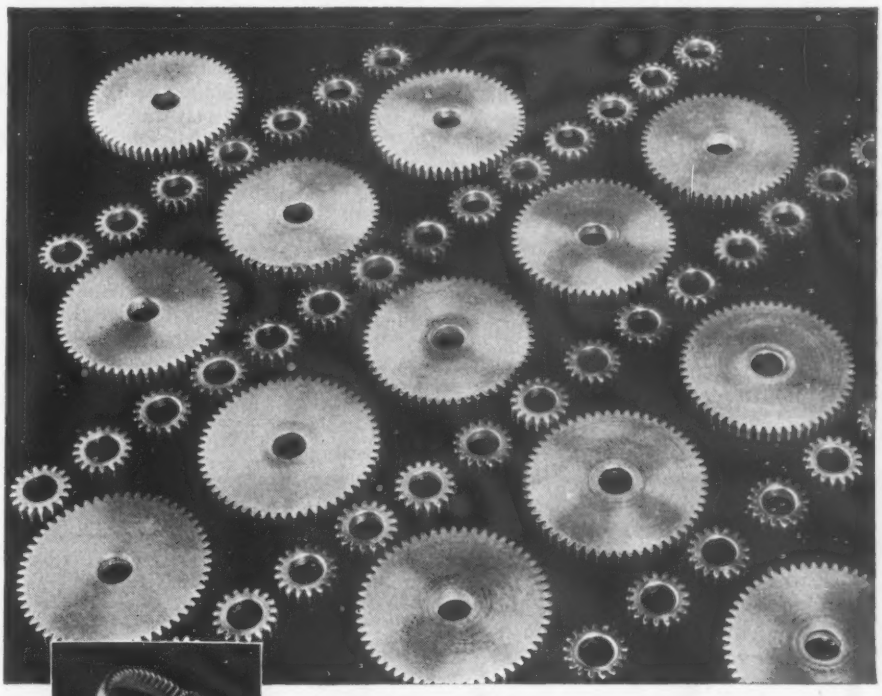
Louisville & Nashville, now inquiring for 2000 freight cars, is expected to be in the market shortly for an additional 1000.

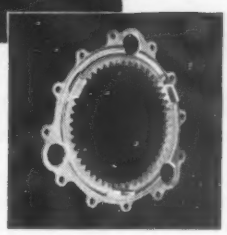
Southern Pacific, 3550 freight cars, including 1800 recently reported as pending; list now comprises 1600 box, 550 general service gondolas, 200 tight bottom gondolas, 250 seventy-ton hoppers and 150 seventy-ton covered hoppers.

LOCOMOTIVES PLACED

United States Army, 303 forty-two-gage 2-8-2 type steam locomotives, 181 going to Baldwin Locomotive Works, Philadelphia; 76 to American Locomotive Co., New York; and 46 to Davenport-Besler Corp., Davenport, Iowa.

Virginian, five 2-8-4 type steam locomotives, to Lima Locomotive Works, Lima, O.





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THE STEEL PRODUCTS ENGINEERING CO.
1206 W. COLUMBIA STREET SPRINGFIELD, OHIO

Number of Foundries in U. S. and Canada Increases

(*Concluded from Page* 90)

exclusively, while 1245 represent departments of plants also making ferrous castings. A large number of the "exclusive" group make more than one type of nonferrous casting, in many cases combining brass and aluminum, or aluminum and magnesium. Canada had a sharp jump in number of nonferrous producers from 278 to 358, nearly 29 per cent.

Brass and bronze castings dominate the nonferrous group in the United States with 2329 producers of this type, although aluminum is a close second with 2210 sources. The magnesium total is 89 foundries. The permanent mold casting process has experienced further growth since 1943, this type of casting being furnished by 336 foundries in the United States and 35 in Canada, compared with 258 and 29, respectively, two years ago. Producers of centrifugal castings number 187 in the United States and 20 in Canada.

California shows the largest percentage growth in total number of plants since 1943—from 331 to 392, or 18.5 per cent—and now is tied with Illinois as the fourth leading foundry state in number of establishments. The California gain occurred principally in nonferrous foundries, reflection of the state's aircraft industry, and places it fourth among all states and only 20 below Pennsylvania, the leader, in total producers of that type. California's 215 producers of aluminum castings are exceeded in number only by New York's 222, and it is practically tied with Michigan and Ohio for top ranking in number of magnesium foundries.

Pennsylvania still is the nation's leading foundry state, although its margin over second-place Ohio has been cut slightly. Ranking of the remaining eight leading states is: New York, California and Illinois (tied), Michigan, Indiana, Massachusetts, Wisconsin and New Jersey. This group accounts for 3425 foundries, or 68 per cent of the country's total, practically the same percentage as in 1943. Next to California, New Jersey and Wisconsin showed the largest percentage increases of the leading states in total number of foundries compared with 1943, their gains being 8.7 and 8.1 per cent respectively.

Cities having the largest number of foundries rank as follows: Chicago 170, Los Angeles 151, Cleveland 110, Detroit 102, New York 95, Milwaukee 72, Philadelphia 67, Boston 61, Cincinnati 56, Toronto 53, St. Louis 51, Buffalo 45. Pittsburgh proper has 35 foundries, although its immediate suburbs include an additional 28 plants. San Francisco and Oakland combined have 55 foundries, while Minneapolis and St. Paul have 64.

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CONSTRUCTION AND ENTERPRISE

OHIO

AKRON—George F. Eddy, 1969 South Main street, will build a machine shop addition 18 x 67 feet, to cost about $3000.

ALLIANCE, O.—American Steel Foundries, 410 North Michigan avenue, Chicago, and 1001 East Broadway, Alliance, will build a plant addition and install paint spraying system, to cost about $29,000.

CANTON, O.—Timken Roller Bearing Co. has WPB authorization for construction of one-story 91 x 200-foot general electric repair shop, to cost $131,100.

CLEVELAND—Oliver Corp., formerly Cleveland Tractor Co., East 193rd and Euclid avenue, has received WPB approval for a one-story 160 x 181-foot plant addition to cost $709,300.

CLEVELAND—Bo-Sal Products Inc. has been incorporated with $50.000 capital to manufacture precision machine parts, by Joseph Bozotl, president, and Earl R. Salisbury, treasurer, and will be established at 3402 Clark avenue.

CLEVELAND—Anchor Machine Products Co., 1646 Doan avenue, will build a one-story 187 x 204-foot plant addition.

CLEVELAND—Fisher Body Division of General Motors Corp., Edward J. Gleason, resident manager, East 140th and Coit road, will start work soon on a one-story 108 x 240-foot die shop at 13821 Coit avenue, to cost about $90,000.

CLEVELAND—McGean Chemical Co., Ralph L. McGean, vice president and general manager, 1106 Republic building, will start soon on construction of a second-story machine shop addition 50 x 50 feet, at 2910 Harvard avenue, to cost about $10,000.

CLEVELAND — Addressograph - Multigraph Corp., 1200 Babbit road, Euclid, O., will build a one-story plant addition 60 x 600 feet, and install scales, sprinkler system conveyors, etc., at cost of about $286,592.

CLEVELAND—Green Ball Bearing Co., J. A. Dever, vice president, 1965 East 66th street, has leased 10,000 feet of additional floor space and will install $30,000 worth of new machinery.

MANSFIELD, O.—Ohio Welding & Boiler Repair Co has been incorporated with $25,000 capital by William L. Kann Jr, and associates. Henkel & Gongwer, Farms Bank building, are agents.

NILES, O.—Lamp department General Electric Co., Cleveland, has WPB authorization for building 100 x 288 feet, at Niles, for manufacture of sealed beam lamps.

PETROLEUM, O.—General American Transportation Corp., East Chicago, Ind., has WPB authorization for building 70 x 300 feet and leanto 20 x 300 feet, for use as machine shop, at Petroleum, to cost about $247,360.

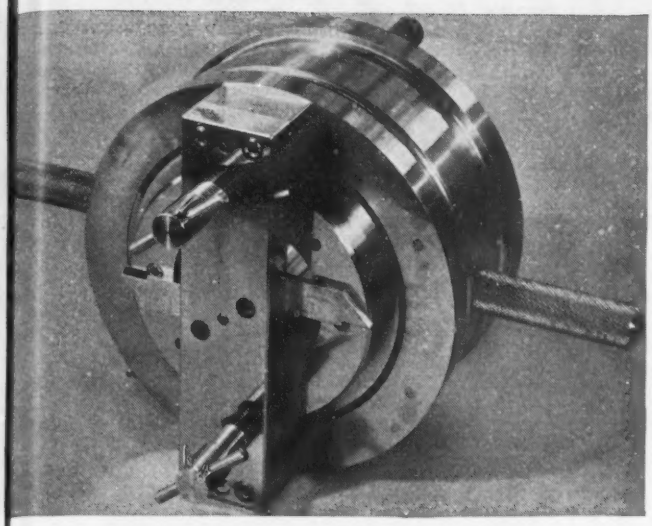
SALEM, O.—Salem Stamping & Mfg. Co., subsidiary of Schnell Tool & Die Co., 631 West State street, has been incorporated to manufacture stamping and metal machine parts.

SANDUSKY, O.—Union Chain & Mfg. Co. will build a one-story addition of 10,000 square feet for pattern shop and lunch room, to cost about $25,000. Project awaits WPB material priorities permission.

WARREN, O.—Copperweld Steel Co. has WPB authorization for an addition 21 x 365 feet and to install equipment, to cost $57,338.

NEW YORK

BUFFALO—American Radiator & Sanitary Corp., 1803 Elmwood avenue, will expand production of stampings in the postwar pe-



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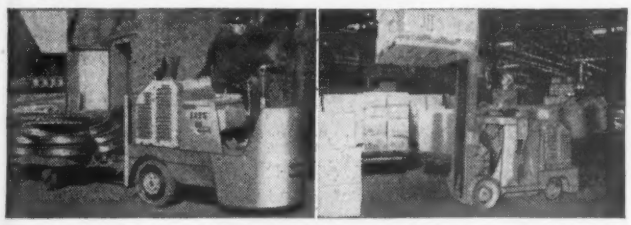

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PENNSYLVANIA

BETHLEHEM, PA—Bethlehem Steel Co., has WPB authorization for construction of an addition to its plant at Johnstown, Pa., and installation of boring and turning equipment, etc. Also authorized to construct building at Johnstown to house and service machine tools, to cost about $187,000.

CORRY, PA.—Raymond Mfg. Co. has received WPB approval for a three-story plant addition and replacement of elevator, transformers, switchboards, etc. to cost $301,770.

PITTSBURGH—Carnegie-Illinois Steel Corp. has WPB authorization for installation of additional facilities, heating furnace, conveyors, timing units, etc., at Dravosburg, Pa., for manufacture of tin plate products, costing $6,410,000

MICHIGAN

DETROIT—LaSalle Sales & Mfg. Co., 424 Book building, has been incorporated with 25,000 shares preferred and 100 shares common, no par value, to deal in tools, dies and jigs, by Carl L. Skidmore, 4250 Cornwall drive, Berkley.

DETROIT—Standard Fabricating Co. Inc. has been incorporated with $500,000 capital to deal in iron, steel and metal products, by David E. Roberts, 2230 Buhl building.

FLINT, MICH.—C. N. Monroe Mfg. Co., 23325 Dort Highway, has been incorporated with $200,000 capital to do a general manufacturing business, by Clarence N. Monroe, 1312 East Court street, Flint.

HIGHLAND PARK, MICH.—Airco Engineering & Mfg. Co., 14300 Oakland avenue, has been incorporated with 2500 shares no par value to do a general manufacturing and engineering business, by Benjamin Schaffer, 11845 LaSalle boulevard.

ILLINOIS

FAIRFIELD, ILL.—Chefford Master Mfg. Co., Benjamin Frankel, president, will build a manufacturing plant to cost $250,000.

MARYLAND

BALTIMORE—Flynn & Emerich Co., with machine shop at 301 North Holliday street and foundry at Granbley avenue and Western Maryland railroad, will build a one-story addition 40 x 121 feet to its foundry, for cleaning and shipping departments. A core room addition was completed early this year.

BALTIMORE—Baltimore Foundry & Machine Corp., Charles and Wells streets, is building a one-story machine shop addition 48 x 80 feet. Company is controlled by McConway & Torley Corp., Pittsburgh, which last fall bought the plant of the Kennedy Corp. and changed its name to the above. Equipment of plants of the Harrison Bolt & Nut Co., Harrison, N. J., and Aetna Forge & Rivet Co., Pittsburgh, will be installed here as soon as conditions permit.

BALTIMORE—Armor Tred Tire Corp., 1600 Patapsco avenue, has let contract for a one-story plant 38 x 158 feet at 1900 Patapsco avenue, to which it will remove its operations. Fred H. Hesse is president and E. A. Finke is general manager.

BALTIMORE—E. I. du Pont de Nemours & Co. plans an important plant expansion for postwar construction, at 2001 Benhill street, Curtis Bay, Md. Plans to produce titanium oxide and similar materials.

BALTIMORE—Seaboard Asphalt Products Inc. will rebuild its burned plant in Fourth avenue, East Brooklyn, Md.

DELAWARE

WILMINGTON, DEL.—Delaware Power & Light Co., Sixth and Market streets, has plans for a gas chamber to cost about $800,000. United Engineers & Constructors Inc., 1401 North Arch street, Philadelphia, are engineers.

MISSSOURI

ST LOUIS—Omar Tool Co., 2350 Palm street, has let contracts for a machine shop addition at 2547 Herbert street, one-story, 49 x 58½ feet, to cost about $7500. Cay G. Weinel, 7220 Dorset street, University City, St. Louis county, is architect.

ST. LOUIS—Ritepoint Co., 1116 South Grand boulevard, manufacturer of pens, etc., has let contract to Fred Daues & Sons, 3117 Pine street, for a one-story 150 x 190-foot plant and office building at 4350 South Kingshighway, to cost about $100,000.

ST. LOUIS — Barry-Wehmiller Machinery Co., 4660 West Florissant avenue is seeking priority on materials for a building expansion program to cost about $250,000. Paul W. Wehmiller is vice president.

ST. LOUIS—National Bearing Metals Division of American Brake Shoe Co., 2930 Manchester avenue, has bought a tract of 98,100 square feet, adjoining the present American Brake Shoe Co. plant.

MINNESOTA

LAKE CITY, MINN.—Gillette & Eaton Inc., W. C. Cheney, general manager, has let contract to Fred M. Olson for two one-story additions to foundry and machine shop, 50 x 107 and 24 x 50 feet, for manufacture of steel pistons and sleeve castings.

MINNEAPOLIS—H. V. Johnston Culvert Co. is remodeling building at 4724 North Mississippi drive for factory to manufacture corrugated metal culverts.

MINNEAPOLIS—G. S. W. Co., 1310 East Franklin avenue, manufacturer of farm equipment, has let contract for a one-story plant 50 x 100 feet, in St. Louis Park.

MINNEAPOLIS—Monomelt Co. Inc., manufacturer of type metal systems, has let contract for a one-story plant addition.

MINNEAPOLIS—Acme Foundry Co., 3161 Hiawatha avenue, has let contract for a one-story foundry addition.

MINNEAPOLIS—General Metalware Co., 1401 Central avenue, manufacturer of sheet metal products, has let contract for a one-story plant addition.

ROCHESTER, MINN.—Walters-Conley Co. plans construction of a one-story plant addition 77 x 84 feet.

ST. PAUL—Brown & Bigelow, war contractors and manufacturers of novelties, await WPB approval for plant conversion and expansion to cost about $5,200,000, including new equipment costing about $2 million, conversion of four buildings costing $1 million, enlargement of main plant costing $1 million and equipment conversion $200,000.

NORTH DAKOTA

BEACH, N. DAK.—Northern Pacific railroad, Northern Pacific building, St. Paul, will let contracts soon for a 500-ton coaling station, including drier house, hoisting machinery, etc., to cost about $120,000.

ELLENDALE, N. DAK.—Fred Hillius has started construction of a one-story machine shop 50 x 90 feet.

IOWA

CHEROKEE, IOWA—Joseph Schissel has bought site for plant to manufacture power lawn mowers.

MASON CITY, IOWA—International Minerals & Chemical Corp., 61 Broadway, New York, plans erection here of a fertilizer plant to cost over $100,000, with equipment.

MONTANA

LIVINGSTON, MONT.—Park Electric Co-operative Inc. will receive bids Aug. 4 for 99.8 miles of power line in Park, Gallatin and Sweet Grass counties. Toivo Karkainen, Helena, Mont., is engineer.

CALIFORNIA

HOLLYWOOD, CALIF.—Fonda Machine Co., 8460 Santa Monica boulevard, West Hollywood is building an addition 20 x 43 feet, to cost about $6500.

LOS ANGELES—California Cornice Steel & Supply Co., 1601 Naud street, has building permit for alterations and improvements to plant, to cost about $3000.

LOS ANGELES—Drake Steel Supply Co. has building permit for plant building at 2638 Century boulevard, Florence District, 70 x 280 feet, to cost about $42,000.

LOS ANGELES—Pacific Pipe Line Construction Co. is building a plant addition at 8732 Juniper street, to cost about $3100.

LOS ANGELES—Coast Sperline Tool Co., 8122 South Compton avenue, is building an addition 38 x 60 feet, to cost about $4560.

SAN DIEGO, CALIF.—Plans are completed and bids taken for additional facilities at plant of Ryan Aeronautical Co. at 2701 Harbor Drive, to cost about $40,000.

OREGON

INDEPENDENCE, OREG.—City has commissioned R. H. Corey, Portland, Oreg., engineer, to prepare plans for proposed sewage disposal plant and sewer extensions, estimated to cost about $50,000.

PENDLETON, OREG.—Walter R. Vankhan, 512 NW Eighth avenue, plans construction of a machine shop for precision work and motor vehicle repair.

WASHINGTON

LONGVIEW, WASH.—Anderson Blowpipe & Mfg. Co., Seattle, has contract to replace and improve dust collecting system at local plant of Weyerhaeuser Timber Co., approved by WPB.

SEATTLE—Rovan Mfg. Co. has been incorporated with $100,000 capital to deal in machinery, by H. C. Vanvalkenburg, 417 East Pine street, and associates.

SEATTLE—Georgia Foundry Co. has been incorporated with $10,000 capital by N. Seidelenbacher, 448 Ravenna boulevard, and associates.

SEATTLE—Todd-Pacific Shipbuilding Co. has let contract to General Construction Co. for installation of additional facilities at Plant B machine shop, totaling about $30,000, including monitored bridge craneway addition.

SEATTLE—Seattle Gas Co. plans installation of [illegible] 15,000-gallon steel storage tanks at 2001 Northlake avenue.

DPC Authorizes Plant Expansion, Equipment

Defense Plant Corp. has authorized purchases (figures are approximate): the following expansions and equipment

Continental Transportation Lines Inc., Pittsburgh, $85,000 to provide transportation facilities, at request of Office of Defense Transportation.

Harris Motor Lines Inc., Charlotte, N. C., $55,000, to furnish motor transport equipment, at request of Office of Defense Transportation.

Pacific Intermountain Express, Salt Lake City, Utah, $300,000 increase in contract, making overall commitment $700,000, at request of Office of Defense Transportation.

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The Moline M32 Special Drilling, Boring and Reaming Machine shown here is one of several designs of completely automatic machines for work on aircraft gun turret rings, but it has many features which are applicable to machining problems presented by other kinds of metal parts.

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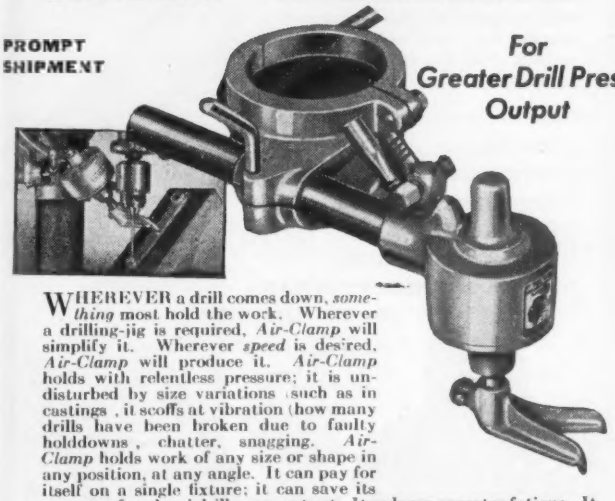

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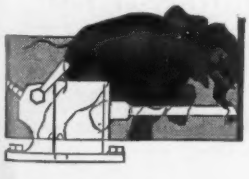

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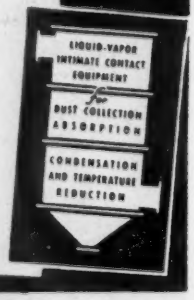

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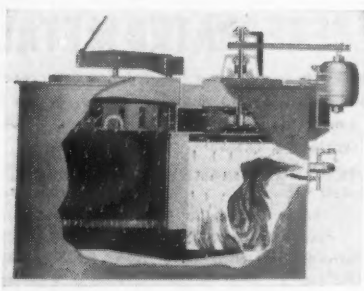

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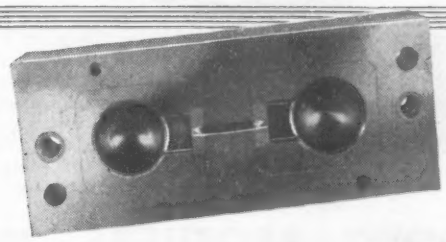

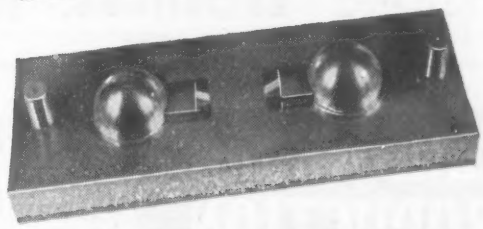

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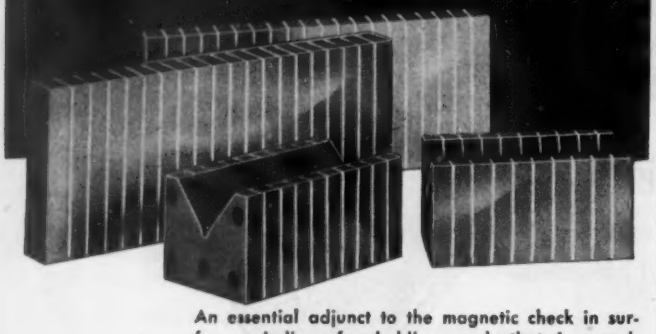

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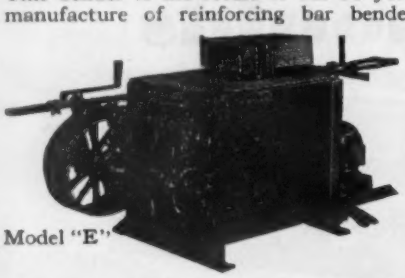

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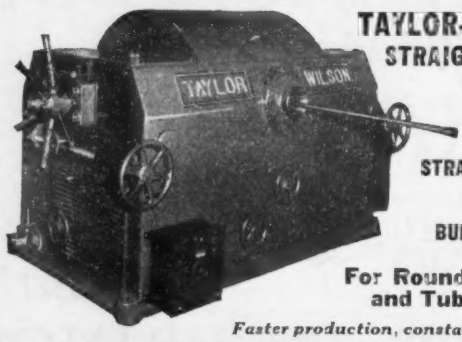

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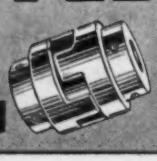

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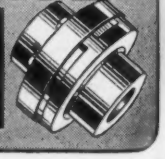

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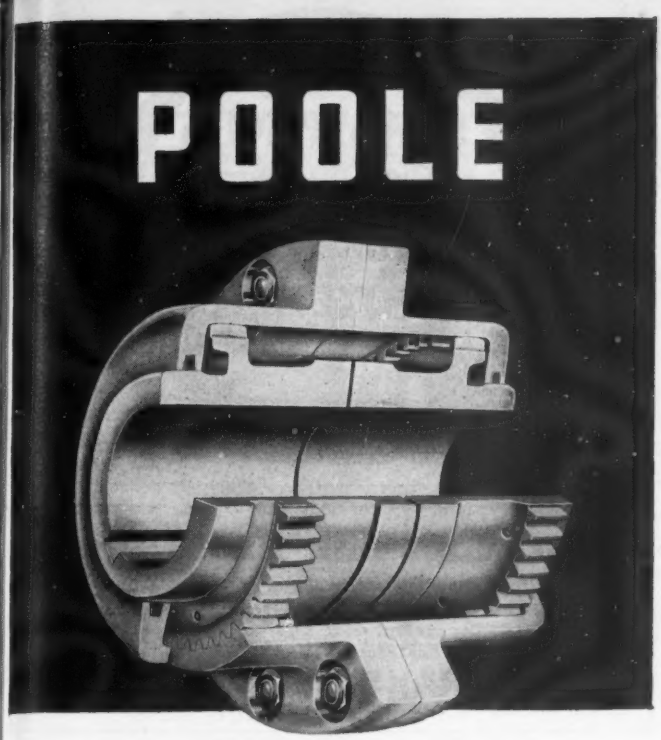

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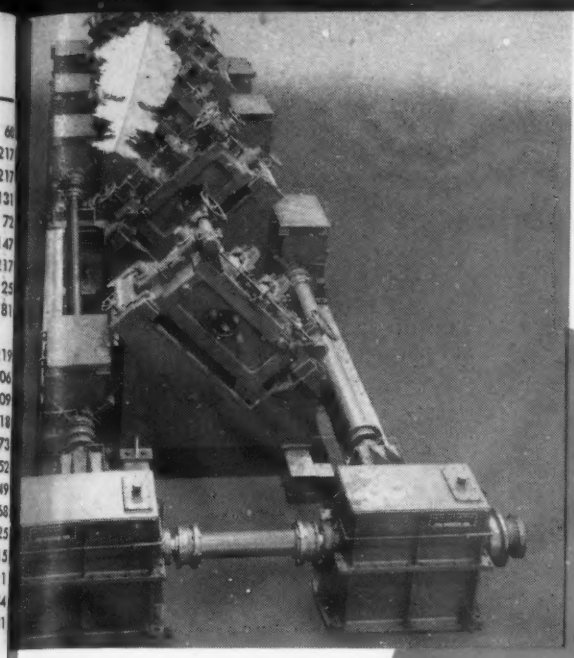

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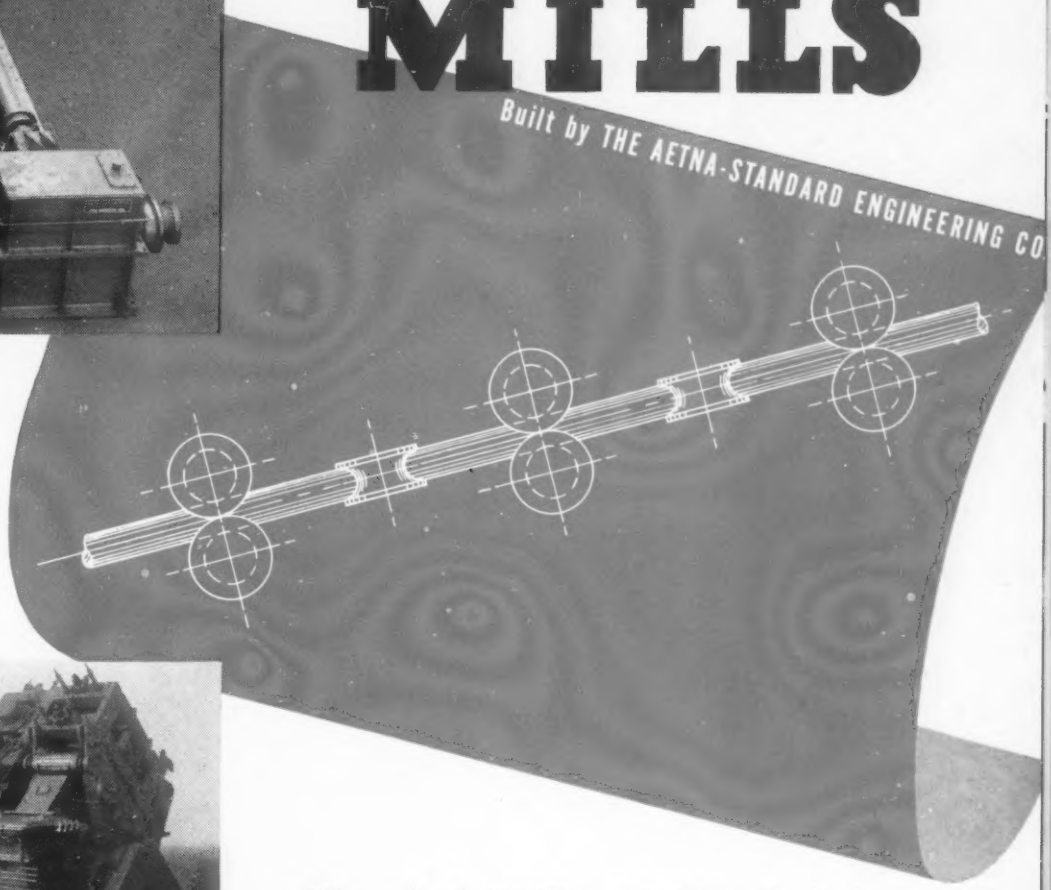
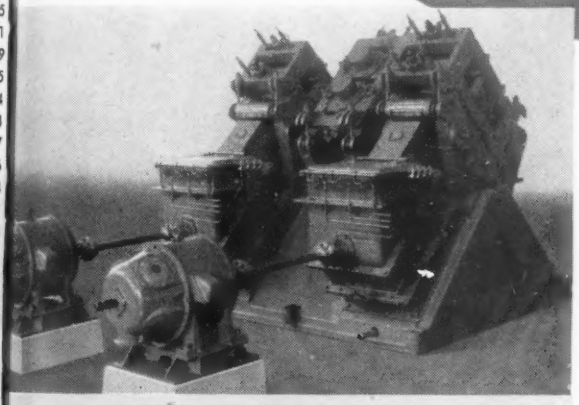


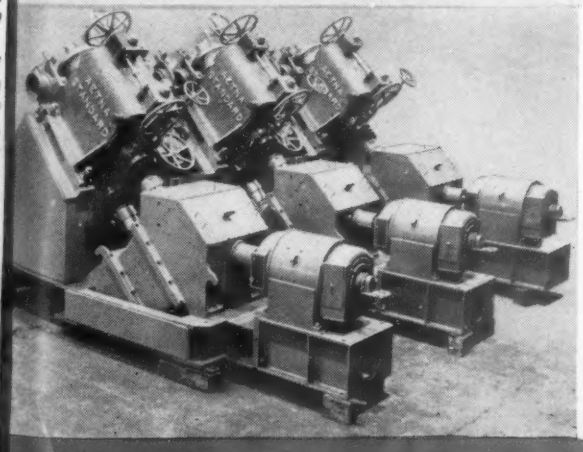
Aetna-Standard builds mills for sizing buttweld, lap weld, or seamless from 3/8" O. D. to 24" O. D. Aetna-Standard has two types of sizing mills . . . closed housing and overhang rolls.



Top—7-Stand sizing mill—28" dia. rolls for 12" O. D. tubes.

Above—3-Stand sizing mill—18" dia. rolls for 5" O. D. tubes.

Bottom—5-Stand sizing mill—24" dia. rolls for 8 5/8" O. D. tubes.



What makes the big difference in sizing mills of today compared with sizing mills of 15-20-25 years ago?

Now all shafts for rolls and drive are mounted in anti-friction bearings to maintain alignment of mill. Backlash is eliminated by use of universal spindles for connecting roll shafts to drive. A centralized grease system for the mill shafts and a circulating oil system for drives reduce maintenance and "down time" to a minimum. Another low maintenance factor is the heavy, rugged construction and the application of renewable hard liners on surfaces subject to wear.

These and other improvements in design make today's sizing mills much more efficient than the old models. Much closer O. D. tolerances can be produced and maintained. Roll adjustments have been greatly simplified, which reduces "down time" and manual labor.

All of which adds up to increased production, closer tolerances, better quality, and lower costs.

Aetna-Standard, exclusive manufacturer of seamless tube mills, makes more sizing mills than all other companies combined. Ask for sizing mill data based upon your requirements.

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